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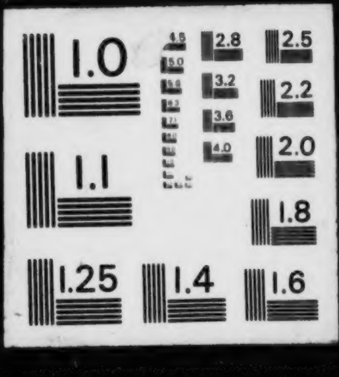
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U.S. DEPARTMENT OF COMMERCE
National Technical Information Service

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WATER-ORIENTED OUTDOOR RECREATION IN THE LAKE ONTARIO BASIN: NEW YORK - PENNSYLVANIA

Bureau of Outdoor Recreation
Ann Arbor, Michigan

PREPARED FOR
Federal Water Pollution Control
Administration, Chicago, Illinois

October 1967

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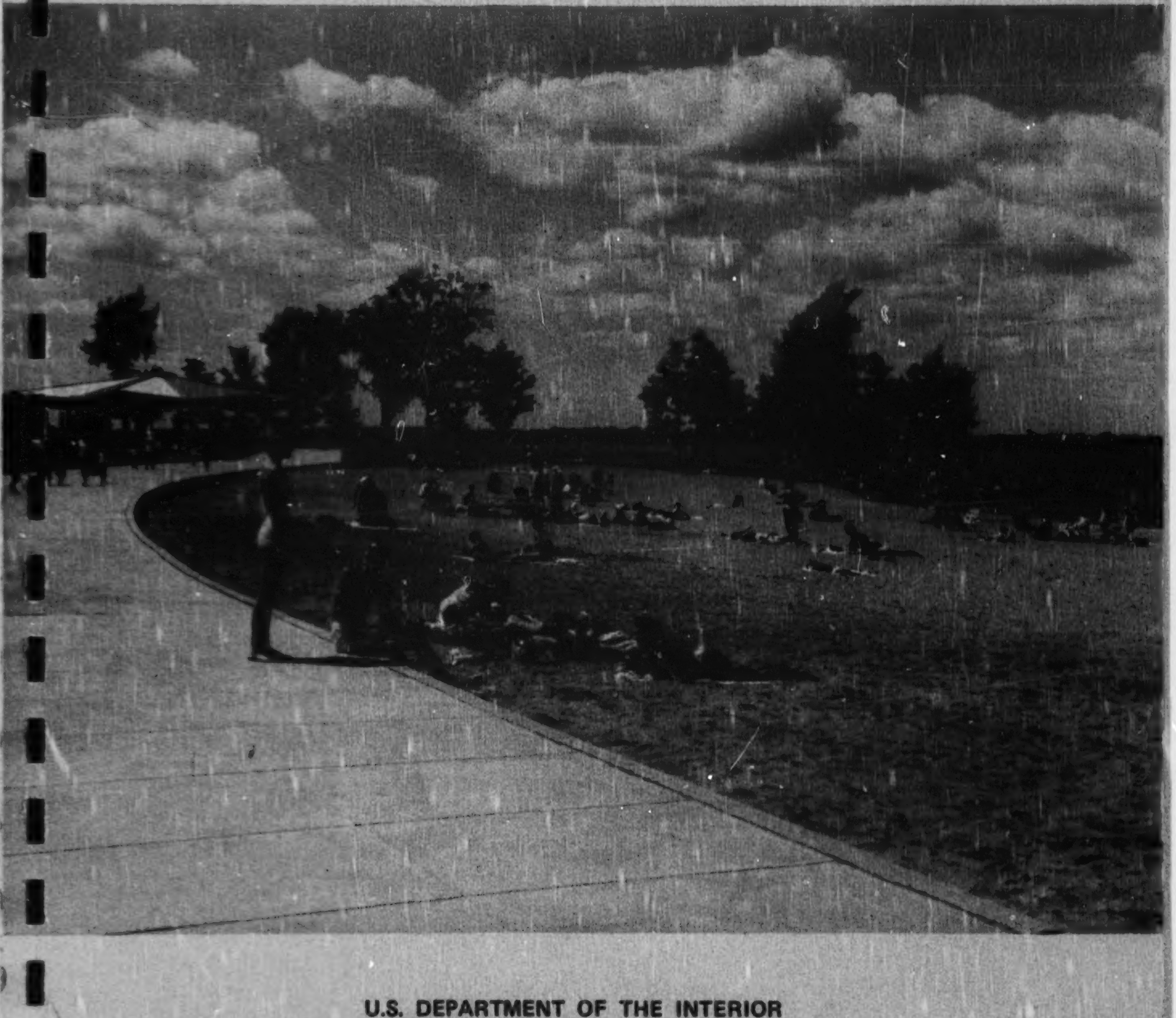
LAKE ONTARIO BASIN

Water-Oriented Outdoor Recreation



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BUREAU OF OUTDOOR RECREATION
Lake Central Region   Ann Arbor, Michigan

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Water-oriented outdoor recreation within the U.S. portion of the Lake Ontario Basin is reviewed in a report serving as an appendix to the Lake Ontario portion of the Great Lakes-Illinois River Basins Comprehensive Study conducted by the Federal Water Pollution Control Administration. The purpose of the study is to: (1) inventory existing recreation resources of the basin; (2) identify proposed and potential recreation areas; (3) determine use pressures on existing facilities and the demand for additional developments; (4) discuss water quality influences on present and future outdoor recreation use; (5) establish objectives for meeting outdoor recreation needs within the basin; and (6) recommend action and/or programs to increase present and future resource capabilities for satisfying recreation requirements. A 210-item bibliography is included as well as various correspondence and memoranda.

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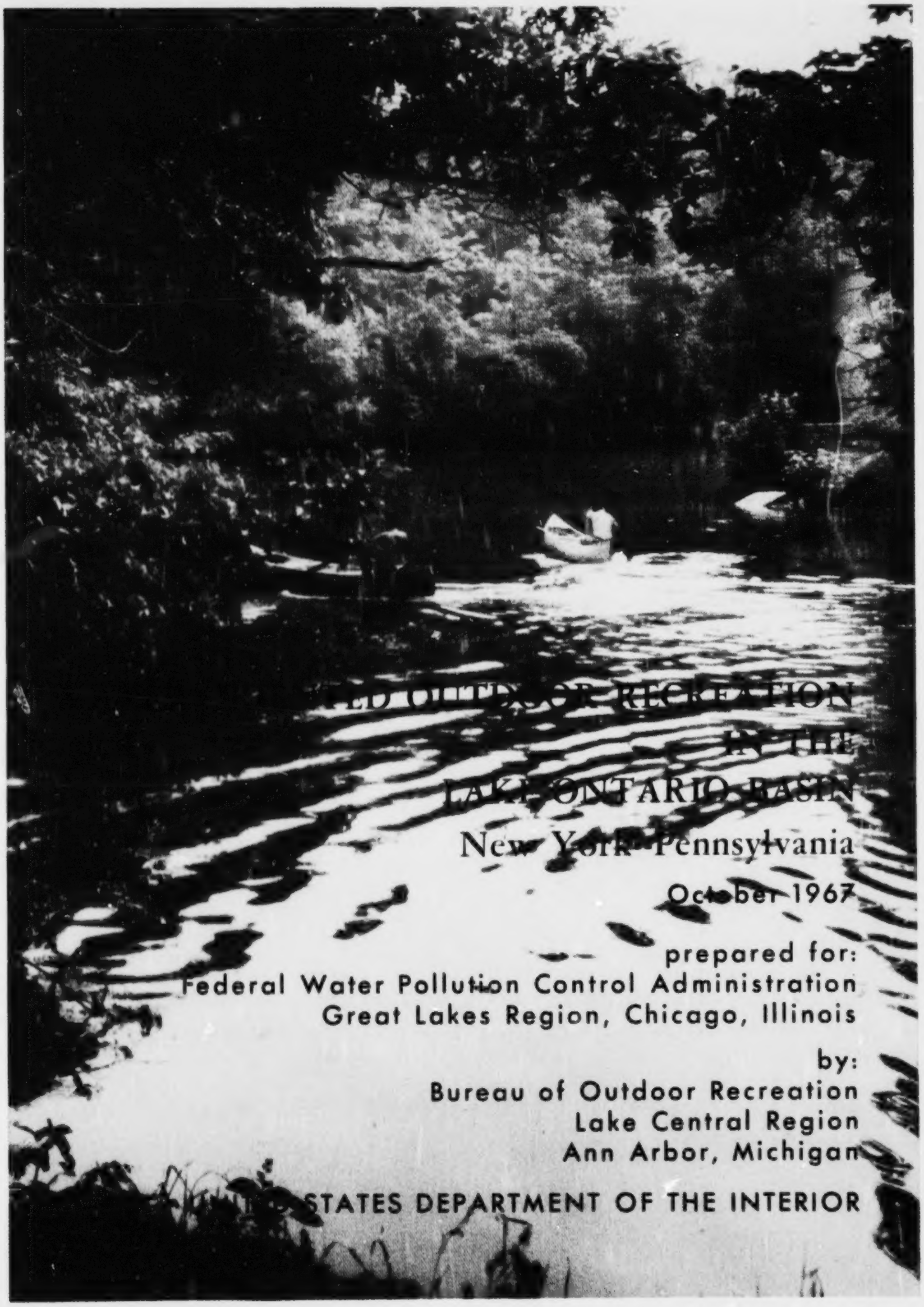

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IN THE
LAKE ONTARIO BASIN

New York-Pennsylvania

October 1967

prepared for:
Federal Water Pollution Control Administration
Great Lakes Region, Chicago, Illinois

by:
Bureau of Outdoor Recreation
Lake Central Region
Ann Arbor, Michigan

UNITED STATES DEPARTMENT OF THE INTERIOR

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF OUTDOOR RECREATION
LAKE CENTRAL REGION
3853 RESEARCH PARK DRIVE
ANN ARBOR, MICHIGAN 48104

May 25, 1967

H. W. Poston, Regional Director
Federal Water Pollution Control Administration
Great Lakes Region
33 East Congress Parkway
Chicago, Illinois 60605

Dear Mr. Poston:

Enclosed is a report on the outdoor recreational aspects of the Lake Ontario Basin. It has been prepared under the basic authorization contained in Public Law 88-29, 88th Congress, enacted May 28, 1963, and in response to your request for our participation in the Great Lakes-Illinois River Basins Project.

Historically, one of the major uses of water in the Lake Ontario Basin has been for recreation. The basin is well endowed with the natural resources required to meet the recreational demands placed upon it. However, waters of poor or low quality have had a deleterious effect upon recreational activities. An analysis of the influence of poor water quality upon swimming was made to establish an indication of the value to recreation of pollution control. It is estimated that control of pollution in presently affected areas would increase swimming annually by nearly three million activity occasions. Since future demand for swimming and other water-dependent recreation activities will increase significantly, it is evident that improved water quality in the Lake Ontario Basin is of critical importance for public enjoyment of these activities.

Recreation planning, acquisition, and development programs in New York State are well underway. The State's Pure Waters Program is just being implemented. Continuation of our partnership with the State is the key to success in achieving our objective of good quality water adequate for the basin's needs now and in the future. We appreciate the opportunity to participate in this study and trust that the attached document will manifest continued action toward this objective.

Sincerely yours,

Roman H. Koenings

Roman H. Koenings
Regional Director

FOREWORD

A Presidential Challenge

This moment marks a very proud beginning for the United States of America. Today, we proclaim our refusal to be strangled by the wastes of civilization. Today, we begin to be masters of our environment.

But we must act, and swiftly. The hour is late, the damage is large.

The clear, fresh waters that were our national heritage have become dumping grounds for garbage and filth. They poison our fish, they breed disease, they despoil our landscapes.

No one has a right to use America's rivers and America's waterways that belong to all the people as a sewer. The banks of a river may belong to one man or one industry or one state, but the waters which flow between those banks should belong to all the people.

There is no excuse for a river flowing red with blood from slaughterhouses. There is no excuse for paper mills pouring tons of sulphuric acid into the lakes and the streams of the people of this country. There is no excuse--and we should call a spade a spade--for chemical companies and oil refineries using our major rivers as pipelines for toxic wastes. There is no excuse for communities to use peoples' rivers as a dump for their raw sewage.

This sort of carelessness and selfishness simply ought to be stopped; and more, it just must be reversed. And we are going to reverse it.

The ultimate victory of reclaiming this portion of our national heritage really rests in the hands of all the people of America, not just the Government here in Washington.

President Lyndon B. Johnson on
signing the Water Quality Act of 1965

Syllabus

No other basin in the Great Lakes system has the range and variety of natural and recreation resources as the Lake Ontario Basin. Its topography, climate, and developed facilities provide a diversity of opportunities for all types of recreation activities. The basin has a relatively abundant supply of water, boasting some 331,520 acres of inland lakes and 28,000 miles of rivers and streams. Nearly five percent of the total land area is utilized for recreation.

The Lake Ontario Basin is an extremely popular tourist mecca attracting annually an estimated 2 1/4 million vacationists. These persons bolster the basin's economy by spending an estimated $142 million on recreational travel.

Two million people inhabit the basin with over one-half residing in the Rochester and Syracuse Standard Metropolitan Statistical Areas. By the year 2020 the basin's population is expected to double. Approximately 65 percent of the developed acreage needed to meet the existing demand for outdoor recreation is presently available for public use in the basin. When privately owned and operated recreation facilities are considered in addition to public areas, the existing unsatisfied demand is further lessened. Nevertheless, the gap remains substantial since overuse of swimming, picnicking, camping, and marina facilities occurs at public recreation areas. The current need for additional developed recreation areas is particularly acute in the Oswego Subbasin and in the Small Streams Tributary Subbasin. Day-use facilities, especially for swimming and picnicking, are needed near the metropolitan areas. The annual demand for camping and marina facilities greatly exceeds the existing supply throughout the basin.

Although the basin is endowed with the natural resources required to meet present and future needs, waters of poor or low quality have had a deleterious effect upon water-dependent recreational activities. Indicators at public recreation areas substantiating this viewpoint are high bacteria counts, large masses of algae and aquatic plants, mass die-off of fish and water turbidity problems--all of which have resulted in decisions of responsible officials to ban swimming at some public beaches. Nearly 2.3 million swimming activity occasions are lost annually because of poor water quality at public bathing beaches.

The most notable causes of pollution affecting recreational waters in the Lake Ontario Basin are poorly treated effluents from municipal sewage systems and industrial plants. Other significant sources of pollution are overflows from combined sewer systems, runoff from urban and rural areas, and wastes from commercial vessels. Many homes and cottages located on the shoreline of inland waters of the basin have inadequate sewage treatment facilities. Seepage from septic tanks and, in some instances, direct discharge of effluent into recreational waters contribute to overfertilization which promotes nuisance aquatic growths. Pleasure boats cause water quality problems in marinas and protected areas which result from the discharge of sewage and dumping of garbage. In addition, littering has degraded the esthetic quality of the recreation resource landscape.

The basin has an excellent highway system which places day-use and overnight recreation facilities within easy driving distance for the majority of its residents. Increased population and income coupled with more leisure time will create increasing pressure on recreation facilities. At the same time, the presence of low quality water at several park and recreation areas denies the recreationist an opportunity to pursue his desire for a pleasant recreational outing. Pollution abatement is a primary and pressing need throughout the basin. To meet these needs, a coordinated, continuous planning and development effort by all agencies engaged in the provision of recreation facilities for the public is necessary.

Planning efforts must develop means of meeting the following goals: (1) acquisition and development of adequate recreation facilities within reasonable distances of those who would use them, (2) water pollution abatement at existing recreation areas and prevention of further contamination of recreational waters and (3) implementation of land use controls and planned development of lands within and adjacent to recreation areas in order to enhance the recreational setting.

Within the past two years, a number of Federal and New York State action programs have been implemented to achieve high quality water-oriented recreation facilities for all citizens. The principal programs in this Federal-State partnership are noted.

Federal

Land & Water Conservation Fund Act of 1965
Federal Water Quality Act of 1965 (amended the original Federal Water Pollution Control Act of 1956)
Clean Waters Restoration Act of 1966

New York State

Recreation Bond Issue Programs ($100 million for acquisition and $400 million for development)
Pure Waters Program ($1.7 billion for water quality improvement)

These action programs are now being implemented. Their relative degree of success will be measured by improved water-oriented recreation facilities and will ultimately be gauged by the satisfaction of the users of those areas.

To meet the basin's needs for high quality, water-oriented outdoor recreation, the following recommendations must be considered:

1. Priority should be given to the development of water-dependent recreation facilities in and near the SMSA's of the Oswego Subbasin, the Genesee Subbasin, and the Small Streams Tributary Subbasin.
2. All governmental agencies, industries, and private organizations utilizing recreational water resources should develop and implement pollution prevention and abatement programs.
3. Direct measures in controlling pollution at its source rather than dilution methods should be stressed in effectively improving the quality of recreational waters.
4. Existing pollution control programs should be accelerated to reduce the eutrophication process of inland lakes, thereby improving the esthetic quality values of recreation.
5. Watershed management and soil conservation practices need to be intensified and extended as a means of reducing soil erosion, preventing sedimentation, and increasing the recreational potential of the basin's water resources.
6. Communities bordering the basin's inland lakes should be encouraged to establish uniform watershed rules and regulations prohibiting pollution of the lake's waters.

There are impressive forces and resources committed to the objective of high quality recreational waters for the Lake Ontario Basin. Continued and improved cooperation between and among Federal, state and local governments is essential to achieving this common goal.

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Chapter 1
Introduction

AUTHORIZATION

"Water-Oriented Outdoor Recreation in the Lake Ontario Basin" was prepared by the Lake Central Region, Bureau of Outdoor Recreation, Department of the Interior, at the request of Mr. William Q. Kehr, Project Director, Great Lakes-Illinois River Basins Project, Great Lakes Region, Federal Water Pollution Control Administration*, Department of the Interior, by letter of July 15, 1963. The Bureau of Outdoor Recreation made the study under basic authorization contained in Public Law 88-29, 88th Congress, enacted May 28, 1963.

PURPOSE

This report serves as an appendix to the Lake Ontario portion of the Great Lakes-Illinois River Basins Comprehensive Study conducted by the Federal Water Pollution Control Administration. The Bureau of Outdoor Recreation's contribution to this comprehensive project is to plan and to coordinate in the development and use of the basin's natural resources in such a fashion that the quantity and quality of outdoor recreation can be optimized. More specifically, the purpose of this study is to: (1) inventory existing recreation resources of the basin, (2) identify proposed and potential recreation areas, (3) determine use pressures on existing facilities and the demand for additional developments, (4) discuss water quality influences on present and future outdoor recreation use, (5) establish objectives for meeting outdoor recreation needs within the basin, and (6) recommend action and/or programs to increase present and future resource capabilities for satisfying recreation requirements. The accomplishment of these objectives will emphasize deficiencies in available recreation opportunities and will provide a framework for the development and improvement of the basin's recreation resources.

SCOPE

This report considers water-oriented outdoor recreation within the United States portion of the Lake Ontario Basin. Also, this study includes consideration of certain winter recreational activities. For reporting purposes the basin comprises five subbasins or zones: (1) Genesee River Basin, (2) Oswego River Basin, (3) Black River Basin, (4) St. Lawrence River Basin, and (5) Small Streams Tributary to Lake Ontario. A reference map delineating the study area is on Page 2-2.

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*Formerly the Public Health Service, Department of Health, Education, and Welfare.

An inventory of recreation areas administered by the Federal Government, the various state agencies, and county governments is herein contained. It is based on information contained in the New York State recreation plan and on data compiled for the Nationwide Plan being prepared by the Bureau. Emphasis is placed on recreation areas such as public beaches, large marinas on Lake Ontario, campgrounds, ski resorts, and group camps. Since the United States Fish and Wildlife Service will prepare a report on fishing and hunting, this report does not attempt an intensive evaluation of these activities. No attempt is made to evaluate urban recreation facilities such as swimming pools, golf courses, day camps, children's playgrounds, amusement parks, and city parks that do not provide facilities for camping or water-oriented recreation. An estimation is made of present use. Projected use is estimated by considering existing, proposed, and potential area development and their capacity to satisfy a projected demand. Certain areas where low water quality has had significant impact in limiting recreation use are discussed. After the needs (in terms of resource requirements) of the basin have been determined, objectives are formulated, and action mechanisms to implement the objectives are suggested. The views of cooperating agencies have been considered in recommending programs or actions to be taken to improve the basin's water recreation opportunities.

BACKGROUND

The Great Lakes-Illinois River Basins Project of the Public Health Service was organized in late 1960 after authorization by the Federal Water Pollution Control Act, Section 2(a), Public Law 86-660. There are three points in the Act pertinent to this study: (1) the development of comprehensive water control programs is mandatory under the Act; (2) the Act recognizes the primary responsibility of the states in the field of water pollution control and directs that the comprehensive studies be carried out in cooperation with the states and with other agencies, Federal and local; and (3) the Act requires that in the development of such comprehensive programs due regard shall be given to the improvements necessary to conserve such waters for, among other things, recreation.

Early in 1962 the National Park Service was invited to participate as a cooperating agency in the comprehensive study. They initiated the study on the Illinois River Basin. During the latter part of 1963, their responsibilities for the project were relinquished to the newly formed Bureau of Outdoor Recreation. The Illinois River Basin study was then completed by the Northeast Regional Office of the Bureau. Because of regional boundary adjustments, responsibility for the project was transferred to the Lake Central Region. The study of the Lake Michigan Basin was completed in October 1965, while the study of the Lake Erie Basin was completed in August 1966.

DEFINITIONS

The following definitions are applied to outdoor recreation terminology in this report.

ACTIVITY OCCASION - The participation by one person in one outdoor recreational activity during all or any part of one day. Thus, one person participating in several activities during a day could account for several activity occasions.

DAY-USE ZONE - Within a 40-mile radius of the central city of a SMSA.

EFFECTIVE POPULATION - That portion of the total population of the recreation market area which would seek recreation opportunity in the basin.

IMPROVED WATER QUALITY - Water which has been recovered through pollution prevention and abatement measures to the point where its chemical and physical characteristics and esthetic appearance are pleasing to the senses of sight, smell, taste, and touch. In addition, such waters must also have been improved biologically to a condition that permits them to meet criteria for whole body contact water recreation activities.

LATENT DEMAND - That recreation demand inherent in the population but not reflected in the use of existing facilities; additional participation could be expected to occur if adequate facilities are made available.

LOW WATER DATUM - A plane of reference which elevations in feet above the mean water level at Father Point, Quebec, are given on navigation charts of the Great Lakes system. The elevations on International Great Lakes Datum (1955) of the low water datum lake levels are: Lake Superior-600.0 feet, Lake Michigan and Huron-576.8 feet, Lake Erie-568.6 feet, and Lake Ontario-242.8 feet.

OUTDOOR RECREATION - Leisure time activities which utilize outdoor recreation resources and facilities (176)*.

OUTDOOR RECREATION RESOURCES - Land and water resources capable of providing outdoor recreation opportunity (176).

PARTICIPATION RATE - The number of occasions within a given time during which individuals participate in the various outdoor recreational activities as set forth in the Outdoor Recreation Resources Review Commission (ORRRC) Study Report No. 19.

RECREATION DAY - A visit by one individual to a recreation development or area for recreation purposes during a reasonable portion or all of a 24-hour period. It is assumed that the average person participates in 2.5 activities during an average visit to a recreational area. Therefore, 2.5 activity occasions equal one recreation day.

RECREATION DEMAND - The expression of people's interest in outdoor recreation opportunities.

RECREATION FACILITIES - Developed structures or conveniences for specific outdoor recreation activities in a designated area (176).

RECREATION MARKET AREA - The zone of project influence from which 80 percent or more of the people are drawn on one day outings and/or weekend (overnight) trips (182).

RECREATION NEEDS - The difference between demand and supply expressed in terms of resource requirements.

RESOURCE REQUIREMENTS - Acres of land and water required to satisfy the recreation needs of the study area's population.

RECREATION RESOURCE AREAS - Those geographic areas having favorable physical features and land use patterns to accommodate extensive recreation development and use (176).

RECREATION SUPPLY - The resources and facilities capable of providing outdoor recreation opportunities.

RESIDENT POPULATION - That population residing within a prescribed geographic area

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* Numbers in parentheses refer to References in Appendix D.

WATER-ORIENTED ACTIVITY - An all-inclusive term embracing water-dependent, water-enhanced, and any other outdoor recreation activities in which water augments the recreation experience.

WATER POLLUTION - The addition of any material or any change in quality or character of a body of water which interferes with, lessens, or destroys a desired use.

WEEKEND-USE ZONE - The area between two circles with 40-mile and 125-mile radii having a common center point with the day-use zone.

STANDARD METROPOLITAN STATISTICAL AREA - A county or group of contiguous counties which contain at least one city of 50,000 inhabitants or more, or "twin cities" with a combined population of at least 50,000. In addition to the county, or counties, containing such a city or cities, contiguous counties are included in a SMSA if, according to certain criteria, they are essentially metropolitan in character and are socially and economically integrated with the central city (152). For a detailed description refer to the definition reported in U.S. Bureau of the Census publications.

VACATION FARM - A private farm where urbanites may spend a vacation in a rural setting. The cash income derived from the vacationers is important since it supplements the farm income.

VACATION-USE ZONE - Areas beyond the weekend-use zone (125 miles).

WATER-DEPENDENT ACTIVITY - A recreational activity which could not be carried out without the use of a body of water.

WATER-ENHANCED ACTIVITY - A recreational activity which is enhanced by the presence of a body of water but can be carried out in the absence of water.

ACKNOWLEDGMENTS

As required by the Bureau's Organic Act, the Lake Central Regional Office has worked closely with state, local, and other Federal agencies in the preparation of this report. The compilation of information, statistical data, etc., would not have been possible without the full cooperation of governmental agencies, universities, quasi-public organizations, and private groups. A special thanks is extended to all those who loaned photographs, whether or not they appeared in the

final report. Although many people with agencies and organizations named below gave willingly of their time to answer questions and to provide requested information for this report, they are too numerous to acknowledge individually; however, their efforts are gratefully appreciated.

FEDERAL

- U.S. Department of Agriculture
  - Forest Service
  - Soil Conservation Service
- U.S. Department of the Army
  - Corps of Engineers
- U.S. Department of Commerce
  - Weather Bureau
- U.S. Department of the Interior
  - Bureau of Commercial Fisheries
  - Bureau of Sport Fisheries and Wildlife
  - Federal Water Pollution Control Administration

STATE

- New York
  - Department of Commerce
    - Travel Bureau
  - Department of Conservation
    - Division of Conservation Education
    - Division of Lands and Forests
    - Division of Motor Boats
    - Division of Parks
      - Central New York State Parks Commission
      - Finger Lakes State Parks Commission
      - Genesee State Park Commission
      - Niagara Frontier State Park Commission
      - Thousand Islands State Park Commission
    - Division of Water Resources
  - Department of Health
  - Department of Public Works
    - Division of Highway Planning
    - Division of Operation and Maintenance
- Pennsylvania
  - Department of Forests and Waters

INTER-STATE

- Great Lakes Commission

LOCAL

- City of Ithaca Youth Bureau
- Monroe County Department of Parks
- Monroe County Planning Council
- Onondaga County Department of Public Works
  - Division of Parks and Conservation
- Wayne County Park Commission

QUASI-PUBLIC

- Lockport YMCA, Inc.

PRIVATE

- Finger Lakes Association, Inc.
- Fingerlakes Houseboat Vacations
- Geneva Times
- Keuka Lake Shore Property Owners, Inc.
- Onondaga Lake Scientific Council
- Outboard Boating Club of America
- Rochester Democrat and Chronicle
- Rochester Times-Union
- Syracuse Herald-Journal

UNIVERSITIES

- Cornell
  - Agricultural Extension Service
  - Department of Agricultural Economics
  - Department of Conservation
  - Department of Rural Sociology
  - Water Resources Center
- Syracuse
  - College of Forestry
  - Department of Civil Engineering
  - Water Research Institute

Chapter 2
General Description

PHYSICAL

Location. The Lake Ontario Basin study area comprises the lake proper, the drainage area to the lake and the St. Lawrence River drainage area. Except for 96 square miles in Potter County, Pennsylvania, the entire drainage area of 16,200 square miles is in the State of New York. One-third of New York State is within the Lake Ontario watershed. Following the long axis of the lake, the study area which includes only that portion of the lake and watershed within the United States is approximately 250 miles in length and 136 miles at its widest point (93,188). The location and extent of the study area is graphically illustrated on Plate No. 2-1. (See also Table No. 2-1 and Table No. A-1, Appendix A.)

Plate No. 2-1

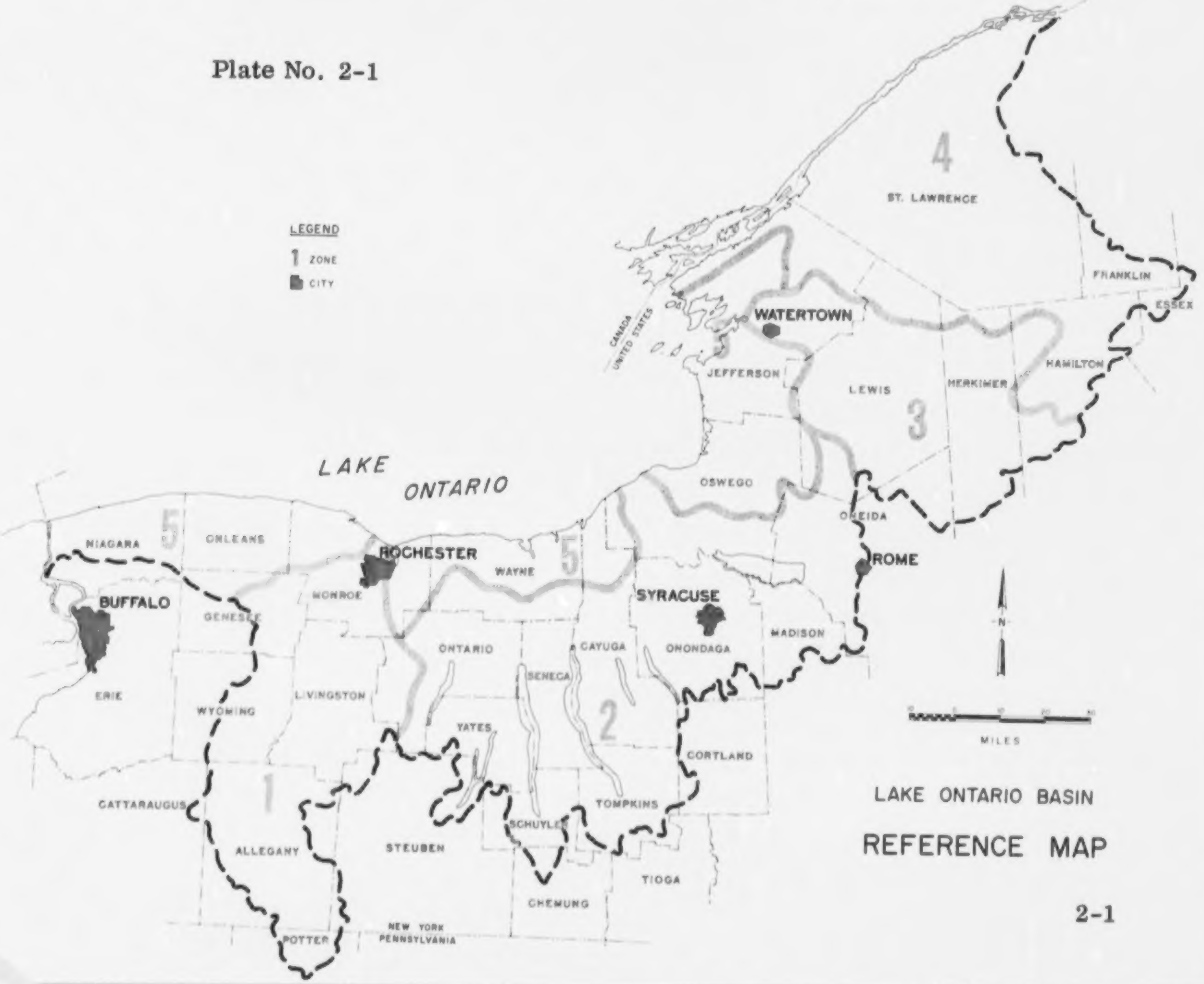

LEGEND
1 ZONE
▪ CITY
CANADA
UNITED STATES
4
ST. LAWRENCE
FRANKLIN
ESSEX
WATERTOWN
JEFFERSON
LEWIS
HERKIMER
HAMILTON
3
LAKE ONTARIO
OSWEGO
ONEIDA
ROME
NIAGARA
5
ORLEANS
ROCHESTER
WAYNE
5
BUFFALO
GENESEE
MONROE
SYRACUSE
MADISON
ONTARIO
CAYUGA
ONONDAGA
SENECA
ERIE
WYOMING
LIVINGSTON
YATES
2
CORTLAND
N
MILES
CATTARAUGUS
1
TOMPKINS
SCHUYLER
ALLEGANY
STEUBEN
TIOGA
CHEMUNG
POTTER
NEW YORK
PENNSYLVANIA
LAKE ONTARIO BASIN
REFERENCE MAP

Table No. 2-1

THE LAKE ONTARIO BASIN
(United States portion)

Total Basin Land and Water Area	19,800 square miles
Lake Area	3,600 square miles
Land Area	16,200 square miles

Source: 146, 188

In this study the Lake Ontario Basin has been divided into five zones corresponding to the major subbasins of the Lake Ontario-St. Lawrence drainage area. They are delineated on Plate No. 2-1 and listed in the following table.

Table No. 2-2

BASIN COMPONENTS

		Area (square miles)		
Zone	Subbasin	Land	Inland Lake	Total
1	Genesee	2,457	22	2,479
2	Oswego	4,833	289	5,122
3	Black	1,870	46	1,916
4	St. Lawrence	3,747	153	3,900
5	Small Streams Tributary	2,775	8	2,783
Total	Basin	15,682	518	16,200

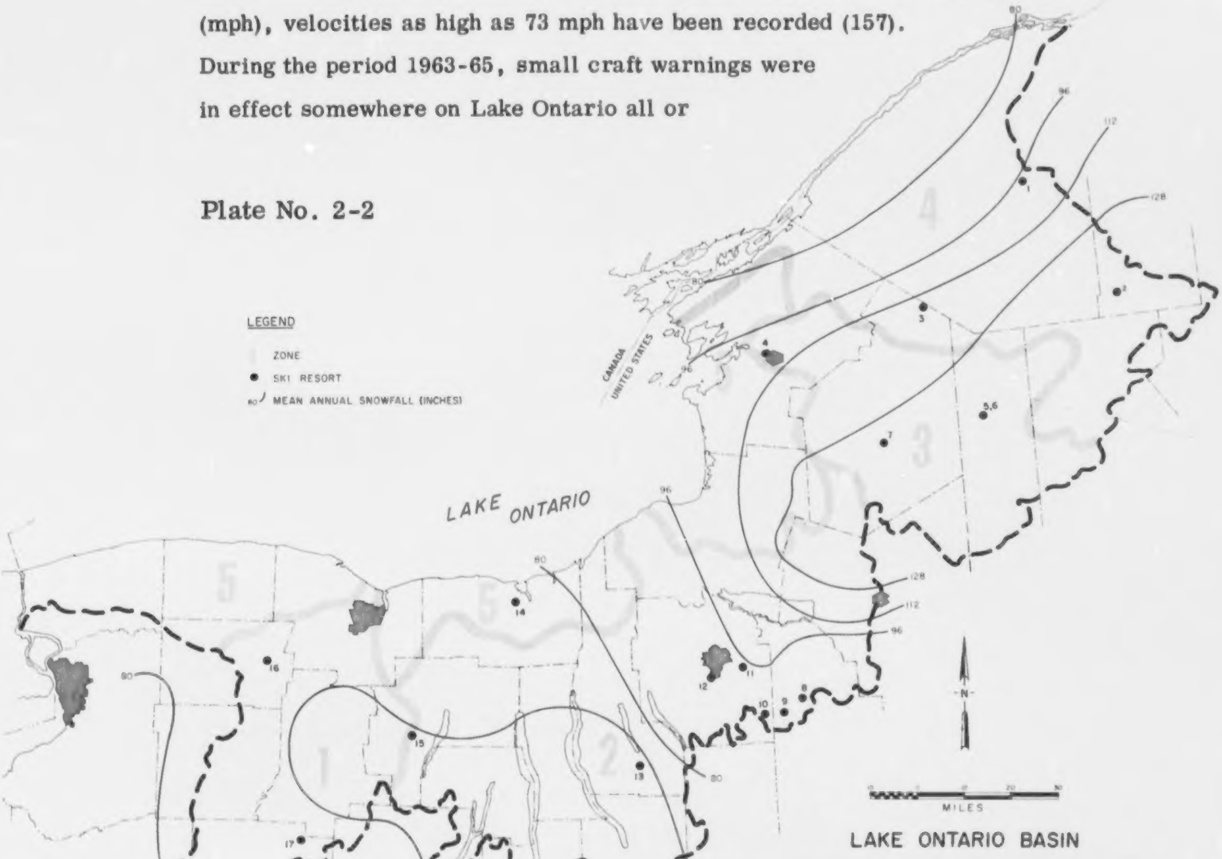
Source: 21, 188

Climate. The climate of the Lake Ontario Basin is Humid Continental-Microthermal (Marine). The combination of three factors determine its climatic character: (1) the presence of large bodies of water, Lakes Erie and Ontario, (2) the existence of relatively high mountains in and adjacent to the eastern reaches of the basin, and (3) the westerly direction of the prevailing winds. Prevailing winds are from west to east in the summer and from southwest to northeast in the winter. These winds as they pass over the lake absorb considerable moisture which is deposited as orographic precipitation upon encountering the high land masses of the Tug Hill plateau and the Adirondack Mountains.

The mean annual precipitation ranges from 32 inches along the lakeshore to 52 inches in the eastern portion of the basin. In winter much of this precipitation is in the form of snow, accounting for the 64-inch annual average reported along the shoreline and 128 inches of snow which accumulates in the northeastern portion of the basin (Plate No. 2-2). Although winter temperatures range as low as -55 degrees Fahrenheit (°F.) in the Adirondack region, temperatures in most areas are less severe. The mean daily January temperatures range from 17° F. in the Upper St. Lawrence Valley to 25° F. along the western Lake Ontario shoreline (157). Large accumulations of snow coupled with favorable climatic and physical features tend to make the basin a popular winter sports area. Public ski centers are abundant and well distributed throughout the entire basin. (Table A-9)

A climatic feature which makes the basin desirable for summer recreation is the cool, pleasant temperatures. The mean daily July temperature ranges from 78° F. to 84° F. and rarely does the temperature exceed 100° F. The number of frost-free days vary from 160-200 along the lake shore to 120-160 in the interior. Wind velocity has a distinct bearing upon participation in recreational boating. Although the wind velocity of the basin averages about 10 miles per hour (mph), velocities as high as 73 mph have been recorded (157). During the period 1963-65, small craft warnings were in effect somewhere on Lake Ontario all or

Plate No. 2-2


LEGEND
ZONE
● SKI RESORT
MEAN ANNUAL SNOWFALL (INCHES)
LAKE ONTARIO
CANADA
UNITED STATES
1
2
3
4
5
5
80
96
112
128
64
48
1
2
3
4
5,6
7
8
9
10
11
12
13
14
15
16
17
N
10
0
10
20
30
MILES

LAKE ONTARIO BASIN

PUBLIC SKI RESORTS AND
MEAN ANNUAL SNOWFALL

parts of 17 days per month during the boating season, May-October (155). According to the Lake Ontario Shoreline Recreation Climate graph appearing in ORRRC Study Report No. 4, there are, on an average, 23 days annually when wind velocities exceed 30 mph during the boating season (Plate No. 2-3). Approximately seven days are foggy during this six month period. Ice usually begins to form on the lake by mid-December and lasts until the first of May (108, 157).

The Land.

Geology. Like all of the Great Lakes Basins, the Lake Ontario Basin is the result of Pleistocene glaciation which largely shaped its present topography. The basin's land area is divided into four regions: (1) the Lake Plains, (2) the Glaciated Plateau, (3) the Tug Hill, and (4) the Adirondack Mountain (25). Reference is made to Plate No. 2-4.

Plate No. 2-3

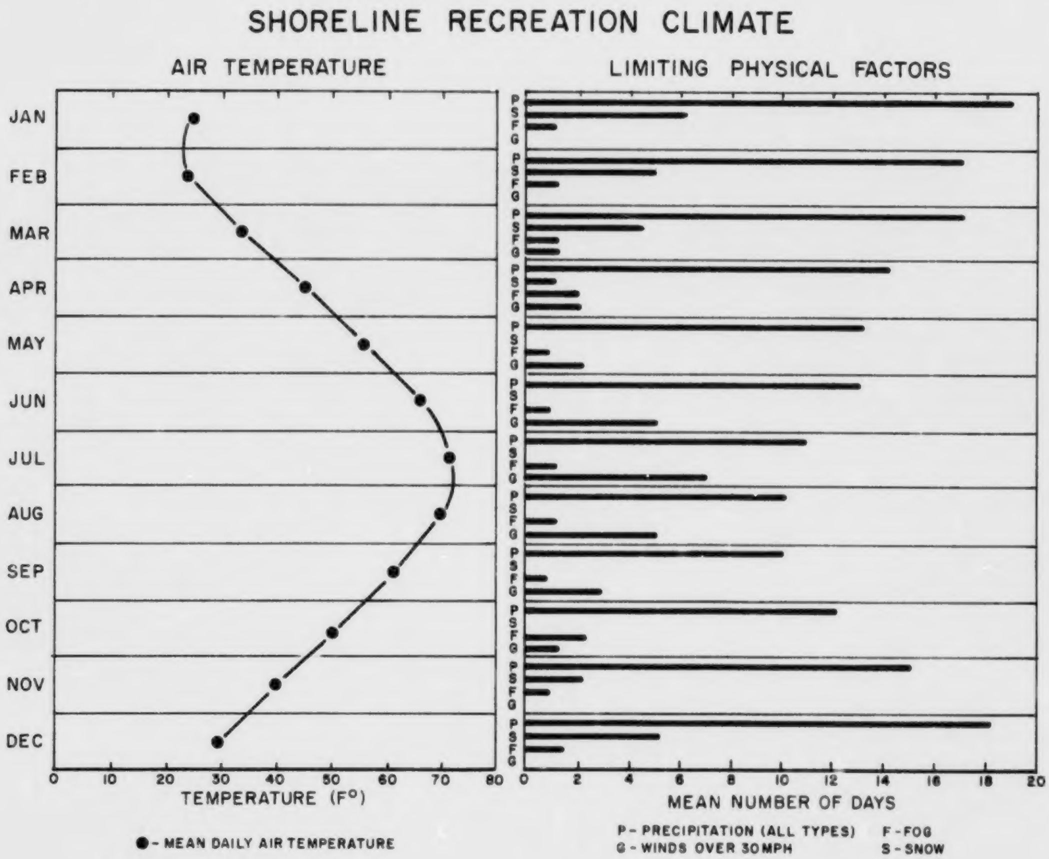
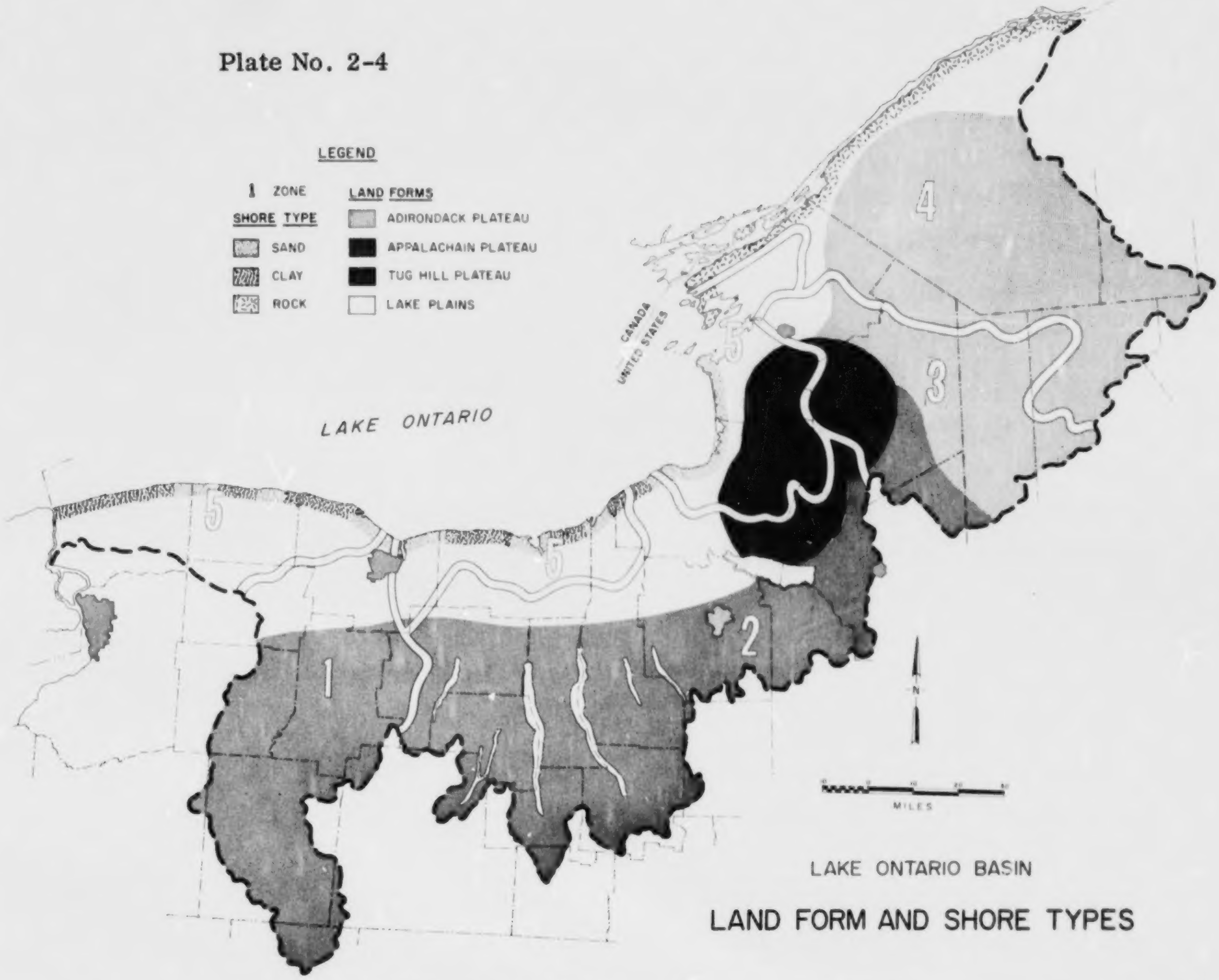


Plate No. 2-4


LEGEND
1 ZONE
SHORE TYPE
SAND
CLAY
ROCK
LAND FORMS
ADIRONDACK PLATEAU
APPALACHAIN PLATEAU
TUG HILL PLATEAU
LAKE PLAINS
CANADA
UNITED STATES
LAKE ONTARIO
1
2
3
4
5
5
5
5
N
MILES

LAKE ONTARIO BASIN

LAND FORM AND SHORE TYPES

The Lake Plains is a slender band ranging from five miles at its narrowest point to a maximum width of nearly 30 miles. This region is flat to rolling and dissected by numerous short streams that flow north into Lake Ontario. Most of the soils, a combination of sedimentary deposits and limestone mixed with glacial till, are productive agriculturally. Along the St. Lawrence River the soils are less productive because of the rocky and swampy character of the land (134).

The Glaciated Plateau, with elevations ranging from 500 to 2,500 feet above mean sea level (a.m.s.l.), covers the southwestern portion of the basin and includes most of the Genesee and Oswego Subbasins. A broad, rolling topography is characteristic of this region with most of the valleys oriented in a north-south direction. Several of these valleys contain lakes while others are deep narrow gorges. Except in the valleys where some limited farming occurs, the soils are generally poor (134).

The Tug Hill Plateau is a unique landscape located between the southeastern end of Lake Ontario and the Adirondack Mountain Region. Approximately 66 million acres are included in this nearly circular highland plateau. Elevations vary from 500 to 2,100 feet a.m.s.l. The terrain is flat to rolling with frequent swamps occurring on a portion of the area which has impervious subsoil. Surface soils are composed of glacial till and are very stony (134).

The Adirondack Plateau Region comprises a group of nearly conical mountain peaks located in the eastern portion of the basin and is the source of many streams that flow to Lake Ontario and the St. Lawrence River. Elevations range from 100 feet a.m.s.l. to a maximum of 4,600 feet at Mt. Santanoni. The metamorphic and igneous rock formations of the region are some of the oldest in the world. Although glacial action took place in this region, some of the mountain peaks were high enough to escape its ravages. The soils of the region are an acid, infertile mixture of sand and stone. Their utility is further limited by massive outcroppings of bedrock which are evident throughout the region (134).

Flora and Fauna. The flora of the Lake Ontario Basin is varied, particularly its trees. A beech-maple timber type prevails throughout with many varieties of conifers intermixed. In the Adirondack Region red spruce and balsam fir are found. White pine, hemlock, and northern white cedar are also found in this region as well as in the Tug Hill area (134).

Of special interest to botanists and nature enthusiasts are the wild yellow lotus beds of Sodus Bay in Wayne County. This is the only known occurrence of yellow lotus as a wild plant in New York State (43).

The wildlife of the Lake Ontario Basin is a significant recreation resource. Aside from its recreational value for hunting, which will be treated in the U.S. Fish and Wildlife Service report on the basin, it has tremendous esthetic appeal.

In addition, the wildlife has had a decided economic influence on rural land values over much of the basin as is evidenced by the number of abandoned farms acquired by individuals and groups for hunting. The basin is especially noted for its large deer population. Waterfowl frequent ponds along the Lake Ontario shore and are found at marshes and wetlands in the interior of the basin. Many species of small game, such as rabbit, raccoon, pheasant, and squirrel, are common to the area.

The basin's many inland lakes, particularly the Finger Lakes, have long been popular for angling. Principal game species found in its aquatic areas include: muskellunge, northern pike, large and small mouth bass, walleyed pike, land locked salmon, and lake, brook, and rainbow trout.

The Water.

Lake Ontario. As the most easterly and smallest of the five Great Lakes, Lake Ontario receives the major portion of its inflow from the Niagara River. The lake is oval in shape with a major axis of about 200 miles. Its surface is approximately 245 feet above mean sea level. The lake is relatively deep near the United States shore with depths of 40 to 100 feet occurring about a mile from the shore. Maximum depth recorded is 802 feet; the average depth is 283 feet. On the United States side are six small islands located near Sackets Harbor on the eastern end of the lake (146, 188).

Seiches occur on Lake Ontario but not to the extent or amplitude found in relatively shallow Lake Erie. Also, lunar tides occur on the Great Lakes, and since their magnitude is only 1 1/2 to 3 inches, they are less prominent than seiches. Both seiches and lunar tides are insignificant from a recreational standpoint on Lake Ontario.

Seasonal fluctuations in the Lake Ontario water levels averaged 2.26 feet annually during the ten year period, 1956-65 (147). The low period normally falls in the winter months, November-February, while the high water period occurs during May-July. The lake's inflow is controlled partially by the hydro developments on the Niagara River. The Iroquois Dam located on the upper St. Lawrence River serves to control the outflow from Lake Ontario and, thus, regulate its water level. Plan 1958-D, developed by the International St. Lawrence River Board of Control in 1963, indicates the water levels of Lake Ontario will be maintained between elevations 242.8 Low Water Datum (LWD) and 246.8 LWD during the navigation season. Long term fluctuations resulting in high or low water cycles are caused by variations in precipitation over extended periods of time. These fluctuations have a pronounced effect on recreational use of the lake. The lake is presently recovering from a low cycle which fell below LWD during the latter part of 1964 and early 1965. During low periods marinas and other boating facilities are often inoperable because water levels are too low to permit boat traffic. During 1951-52 many recreation facilities, especially those on private lands, were damaged extensively by high water.

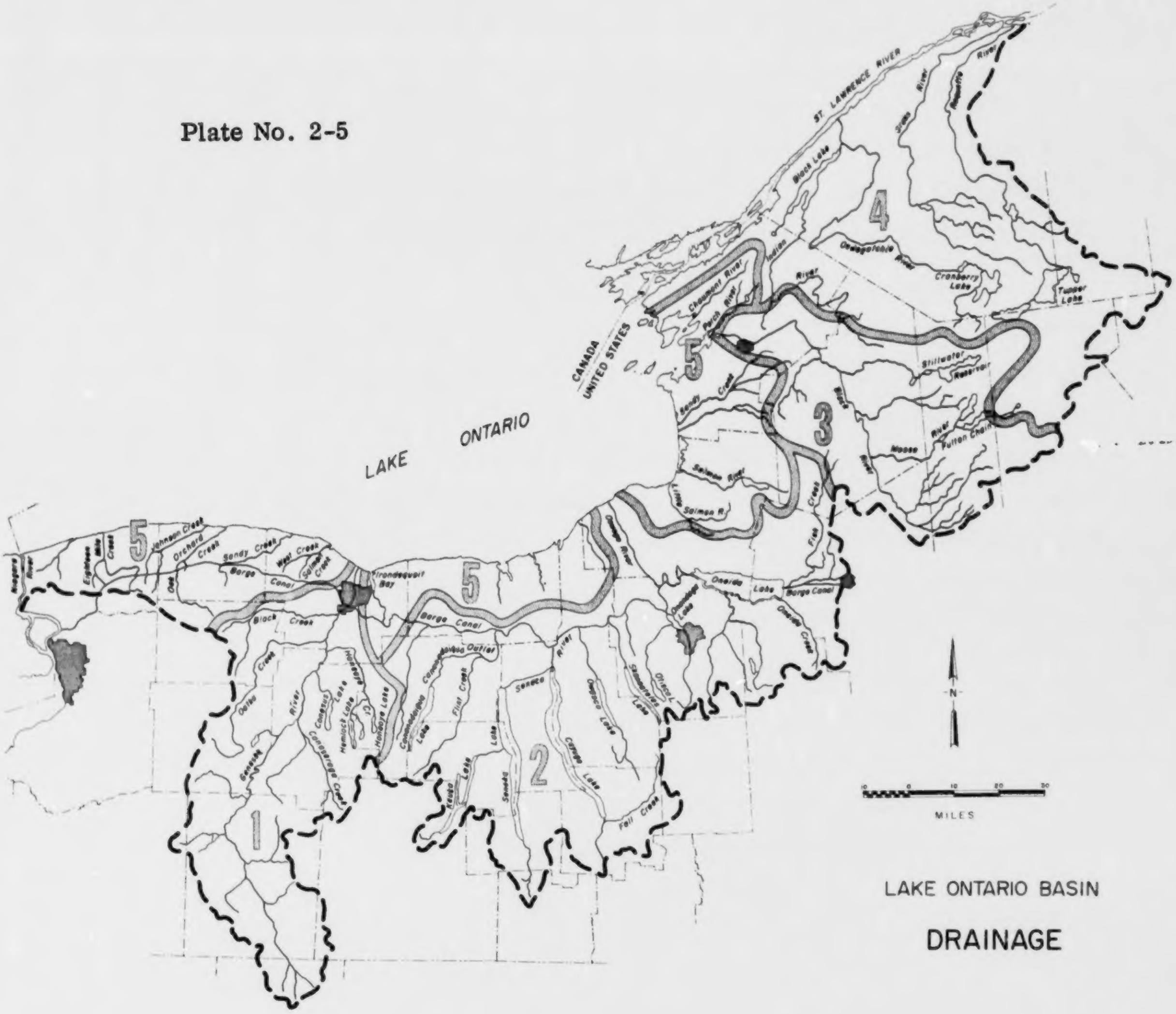
The Shoreline. The United States shoreline of Lake Ontario (including islands) between the Niagara River and the Iroquois Dam on the St. Lawrence River is about 726 miles in length. The southern shore is extremely regular with few natural embayments. The shoreline consists principally of eroded clay and silt bluffs, but from Braddock Bay eastward there are occasional ponds or bays. These bays have sandbar barriers across their mouths which render them ineffective as recreational boat harbors. The U. S. Army Corps of Engineers has improved several bays by dredging and by installing groins.

Sand beaches are narrow and infrequent west of Oswego; however, there are good beaches at Fair Haven and Hamlin Beach State Parks and at Ontario Beach in Rochester. East of Oswego, excellent sand beaches are common up to Henderson Harbor. From Henderson Harbor northward to the head of the St. Lawrence River, the shore is low and rocky, precluding extensive beach use (Plate No. 2-4).

One of the more striking shore formations lies east of Sodus Bay where the erosion of drumlins has created topography resembling what one might expect to encounter on the moon. The Thousand Island Region at the head of the St. Lawrence River cuts through an area of glaciated crystalline rocks forming an isthmus between the ancient Laurentian Highlands of Canada and the Adirondacks of New York. The "granite knob" country, though low in relief, has a jumbled topography that gives the countryside a picturesque appearance exemplified by the St. Lawrence River flowing through the Thousand Islands (194).

Rivers. The Lake Ontario Basin contains three major rivers: the Genesee, Oswego, and Black. There are also many smaller tributaries which form a belt, ranging from 8 to 31 miles in width, around the southeastern and eastern shores of the lake (Plate No. 2-5). The basin contains approximately 28,000 miles of rivers and streams (204). In this report the St. Lawrence River is considered as part of the Ontario Basin, but from a technical standpoint the reverse is true, viz., Lake Ontario is tributary to the St. Lawrence River. Important tributaries to the St. Lawrence River are the Oswegatchie, Raquette, and Grass Rivers which originate in the Adirondacks.

Plate No. 2-5


LAKE ONTARIO
CANADA
UNITED STATES
ST. LAWRENCE RIVER
Black Lake
Indian
River
Oswegatchie River
Grass River
Raquette River
Cranberry Lake
Tupper Lake
Chaumont River
Perch River
Stillwater Reservoir
Black River
Moose River
Fulton Chain
Sandy Creek
Salmon River
Little Salmon R.
Fish Creek
Oswego River
Oneida Lake
Barge Canal
Oneida Creek
Onondaga Lake
Otisco L.
Skaneateles Lake
Owasco Lake
Cayuga Lake
Seneca River
Seneca Lake
Keuka Lake
Fall Creek
Flint Creek
Canandaigua Outlet
Canandaigua Lake
Honeoye Lake
Hemlock Lake
Conesus Lake
Canaseraga Creek
Genesee River
Oatka Creek
Black Creek
Irondequoit Bay
Salmon Creek
West Creek
Sandy Creek
Barge Canal
Orchard Creek
Johnson Creek
Oak Creek
Eighteen Mile Creek
Niagara River
1
2
3
4
5
5
5
5
N
10 0 10 20 30
MILES

LAKE ONTARIO BASIN

DRAINAGE

The principal uses of the basin's rivers are domestic and industrial water supply, transportation, power development, and recreation. To varying degrees, all subbasins supply water for domestic and industrial use. The Oswego, Seneca, Oneida, and Clyde Rivers have been canalized for barge traffic and are part of the New York State Barge Canal System. Power generation facilities have been extensively developed in the Black River Basin, along the St. Lawrence River, and on the lower Niagara River. The St. Lawrence Seaway, which ties the Great Lakes to the Atlantic Ocean, is a major transportation artery serving the shipping interests of Canada and the United States (188).

Several rivers in the basin have natural features which are extremely attractive from a recreational standpoint. The rapids of the Niagara, the gorge of the Genesee, and the Falls on Taughannock Creek are examples. Taughannock Falls, a 215-foot cataract, is the highest straight-drop falls east of the Rocky Mountains (27). Most of the rivers rise in the forested interior and run clear and cold in their initial stages. All of the rivers in the basin have scenic quality.

Inland Lakes. The Lake Ontario Basin is well endowed with natural lakes. Glaciation, erosion, and surface upheaval have given rise to the spectacular Finger Lakes which occupy a series of nearly parallel troughs in the southwestern portion of the Oswego Subbasin. Of the Finger Lakes, Seneca and Cayuga are the largest, each having approximately 66 square miles of water surface. Oneida Lake, also in the Oswego Subbasin, is the largest lake in the basin and covers 80 square miles. The inventory of natural and artificial lakes in Appendix A (Table No. A-2) reveals that the average inland lake of the basin is 435 acres in size.

Barge Canal System. The New York State Barge Canal is an inland waterway system connecting several major drainage basins in the State. It permits travel through portions of the Oswego and Genesee Subbasins as well as Lake Ontario. There are 57 concrete locks in the system with electrically operated gates. Twenty of the locks are in the 230-mile portion of the system which lies within the basin. A twelve-foot channel depth is maintained throughout most of the canal. Although the system was originally constructed for commerical purposes, only 82 commerical barge permits were issued in 1965, while at the same time 10,026 permits were issued for recreational boat use of the locks (94, 96, 188).

Land Use.

Urban. Table No. 2-3 indicates that 12 percent of the basin is devoted to urban and other nonagricultural uses. Each year more land is being removed from agricultural production. Conklin (18) reports that farm acreage in New York State has declined at the rate of 250,000 acres per year from 1950 to 1960. Subdivisions are springing up around the metropolitan centers of the basin. Urbanization in the Lake Ontario Basin is concentrated primarily in ten designated SMSA counties.

Table No. 2-3

LAND USE IN THE LAKE ONTARIO BASIN

	Acres	Square Miles	Percentage of Basin
Agricultural			
Cropland	3,089,920	4,828	29.8
Pasture	1,171,200	1,830	11.3
Forest	4,033,280	6,302	38.9
Other	456,320	713	4.4
Subtotal	8,750,720	13,673	84.4
Inland Lake Area	331,520	518	3.2
Urban & Other Non-Agricultural	1,285,760	2,009	12.4
Total	10,368,000	16,200	100.0

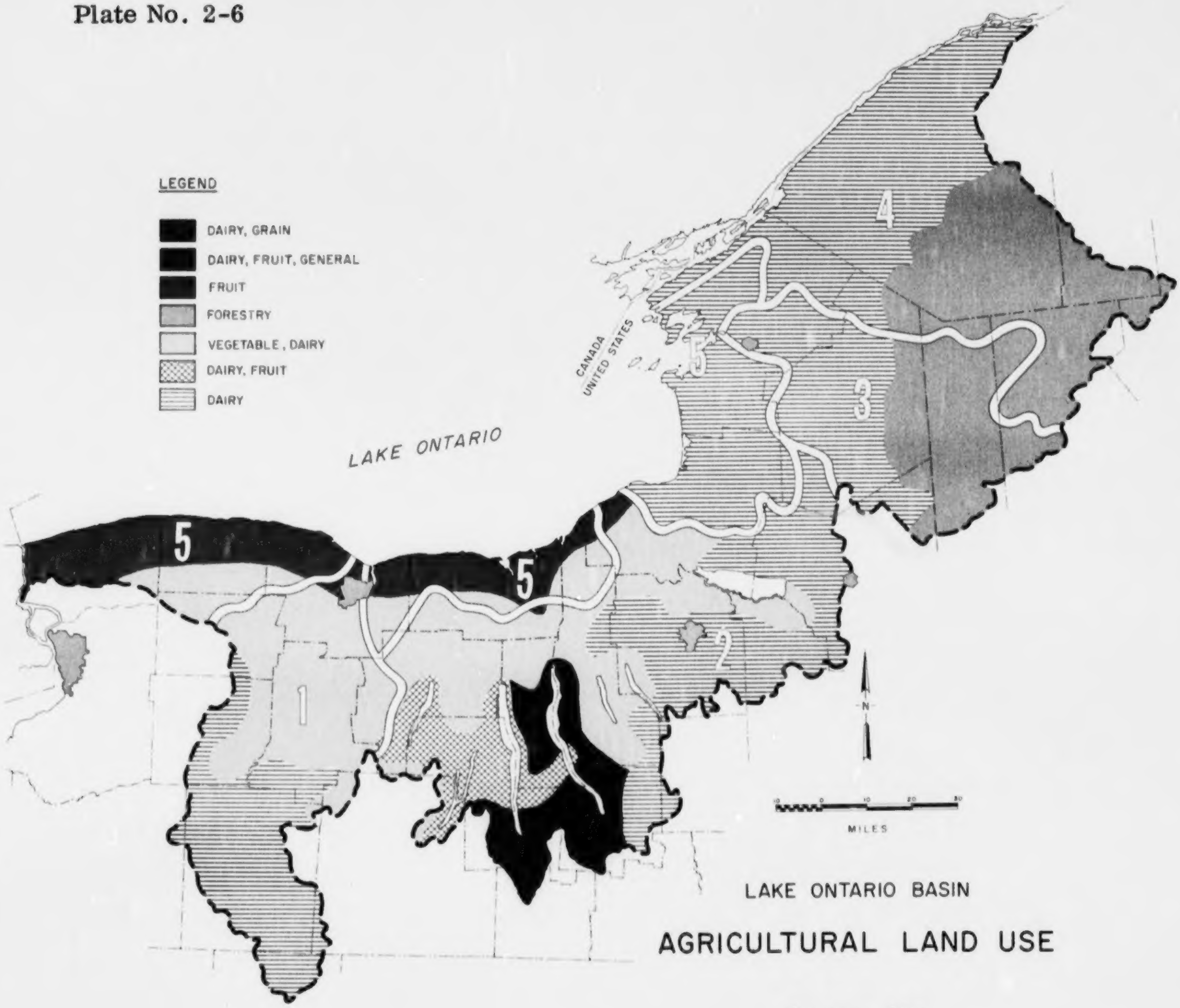
Source: 70, 134, 142, 151

Agricultural. The vast amount of land in agriculture gives the Lake Ontario Basin a decidedly rural setting, however, as noted earlier, agriculture is giving way to other land uses. Farm output in New York State has increased by one-third since 1900, while the land devoted to commercial farming has declined by 50 percent in the same period. Consequently, eleven million acres have been made available for such purposes as urban uses, reforestation, and outdoor recreation (18).

Dairying, in combination with other types of farming, is the predominant agricultural activity in the basin. In the western half of the basin, fruit and vegetable production is also very important. In the spring the orchards in bloom present a colorful spectacle. These are located for the most part in a belt about 30 miles wide along the south shore of Lake Ontario where they are influenced by the climatic benefits of the lake. Agricultural land use within the basin is illustrated on Plate No. 2-6. The pastoral setting, which predominates throughout the basin provides a change of pace for touring urbanites.

Forest land, which has been included under the general heading of "Agricultural" in Table No. 2-3, accounts for nearly one-half of the land allocated to agriculture

Plate No. 2-6


LEGEND
DAIRY, GRAIN
DAIRY, FRUIT, GENERAL
FRUIT
FORESTRY
VEGETABLE, DAIRY
DAIRY, FRUIT
DAIRY
LAKE ONTARIO
CANADA
UNITED STATES
1
2
3
4
5
5
5
5
N
10 0 10 20 30
MILES

LAKE ONTARIO BASIN

AGRICULTURAL LAND USE

Source: 134

and for over one-third of the basin's total land mass. That portion of the land which is forested varies from about 20 percent in the Genesee and Oswego Subbasins to nearly 100 percent in the Adirondack Region. Much of the forest land in the Adirondack Region is in the state-owned Adirondack Forest Preserve. Outside this region, most of the forest land is privately owned, although there are scattered state-and county-owned forests. These exist principally in the southern and eastern portions of the basin. The Forest Service administers about 13,000 acres of forest and range land in the Oswego Subbasin. This area, the Hector Land Use Area, is open to the public for recreational purposes.

Recreational. The basin boasts more than one-quarter million acres of public parks, forest, wildlife, and other recreation areas. In addition, thousands of acres of privately owned land are used for recreation. These include resorts, cottages, private clubs, marinas, ski lodges, and group camps. Many submarginal farms have been converted to "rural retreats" and are used during vacations, fishing and hunting seasons, and, as some urbanites have said, "just to get away from the hustle and bustle of city life". (18).

Genesee Subbasin. The land and water resources of the Genesee Subbasin offer a variety of features important for recreation. The Genesee River, one of the longest rivers in New York, is a major recreation attraction. It offers a number of scenic features including the Genesee Gorge, often referred to as the "Grand Canyon of the East". The Gorge, located near the center of the subbasin, is over 17 miles long and nearly 600 feet deep. Within a section of the gorge are a series of waterfalls, the highest being 107 feet. The walls of the gorge, the meandering course of the rushing river, the waterfalls, and the forested slopes present a dramatic geological story and comprise one of the outstanding scenic and recreation areas in the subbasin (68). See Plate No. 2-7.

The inland lakes of the Genesee Subbasin are scenically attractive, offer good fishing, and are popular vacation resort areas. Those adaptable to extensive aquatic recreation include Lakes Honeoye, Canadice, Hemlock, and Conesus, often collectively called the "Little Finger Lakes". The Bergen Swamp in the vicinity of Black Creek is especially noted for its unique botanical features. Approximately 500 acres are presently being preserved by the Bergen Swamp Preservation Society (68).

The rural landscape of the Genesee Subbasin also offers considerable scenic appeal to the tourist. The headwaters and the central part of the subbasin are mountainous and contain some of the highest elevations in western New York. At one location the elevation reaches 2,548 feet a.m.s.l. State forests comprise approximately 10,000 acres of scenic land in the central portion of the subbasin where excellent year-round recreational opportunities can be enjoyed.

Oswego Subbasin. The Oswego Subbasin ranks high among the vacation areas of New York State and its resources have high scenic and recreational quality. The Finger Lakes including Skaneateles, Owasco, Cayuga, Seneca, Keuka,

Plate No. 2-7

"Genesee Gorge" at Letchworth State Park showing a vertical drop of nearly 600 feet. (Photo by New York State Department of Commerce)

and Canandaigua, are the most interesting natural features of the subbasin. These lakes are of glacial origin and offer examples of interesting geology. The larger Seneca and Cayuga Lakes are about equal in size, ranging from 36 to 40 miles in length and averaging 3 miles in width. Lake Owasco, the smallest of the group, is approximately 14 miles long.

Several state parks in this subbasin are noted for their glens and cascades. Watkins Glen and Taughannock Falls are the most outstanding examples where deep stream gorges reach depths of 200-500 feet.

There are extensive marshlands within the Oswego Subbasin which are valuable as waterfowl habitat. A portion of the Montezuma Swamp near Cayuga Lake and Cicero Swamp along Oneida Lake is managed as a wildlife refuge (67).

Black Subbasin. Wilderness features are characteristic of the Black Subbasin. Nearly one-half of the subbasin is within the Adirondack Forest Preserve which comprises much of the rugged mountain and forest terrain in New York. With the exception of the small farms along the Black River Valley, most of the subbasin is heavily forested. Parts of the Adirondack Mountains reach elevations above 3,000 feet and extend into the eastern portions of the subbasin. Little Moose Mountain is the highest peak with an elevation of 3,630 feet. Tributary to the Black River is an extensive system of rivers, streams, and lakes which are noted as excellent fishing and canoeing waters. The Fulton Chain of Lakes, in particular, is one of the most popular summer vacation areas in the Adirondack region. Several streams have gorges and waterfalls with considerable esthetic appeal, including Whetstone Gulf and Roaring Creek located west of the Black River in the Tug Hill plateau (66).

St. Lawrence Subbasin. The headwaters, lakes, marshes, and streams of the three main tributary rivers to the St. Lawrence River are located in the northern and western sections of the Adirondack Mountain Region. The three main rivers in the subbasin include the Oswegatchie, Grass, and Raquette. These rivers drain numerous lakes and ponds whose mountain setting, good water quality, well-forested shoreline, and abundant wildlife are valuable as recreation resources.

Small Streams Tributary Subbasin. The principal recreation feature of the Small Streams Tributary Subbasin is the 315-mile Lake Ontario shoreline with its beaches, bluffs, sand dunes, inlets, and bays. A significant recreational asset to the subbasin is the abundance of small upland game, waterfowl, and deer. The rolling, wooded northeastern sector of the subbasin is valued for its game and excellent trout fishing in the Salmon River. Most of the terrain west of Oswego is relatively flat and extensively farmed. In general, the inland portions of this subbasin have limited scenic appeal. However, the large fruit orchards present a colorful spectacle during the blossom period in the spring (69).

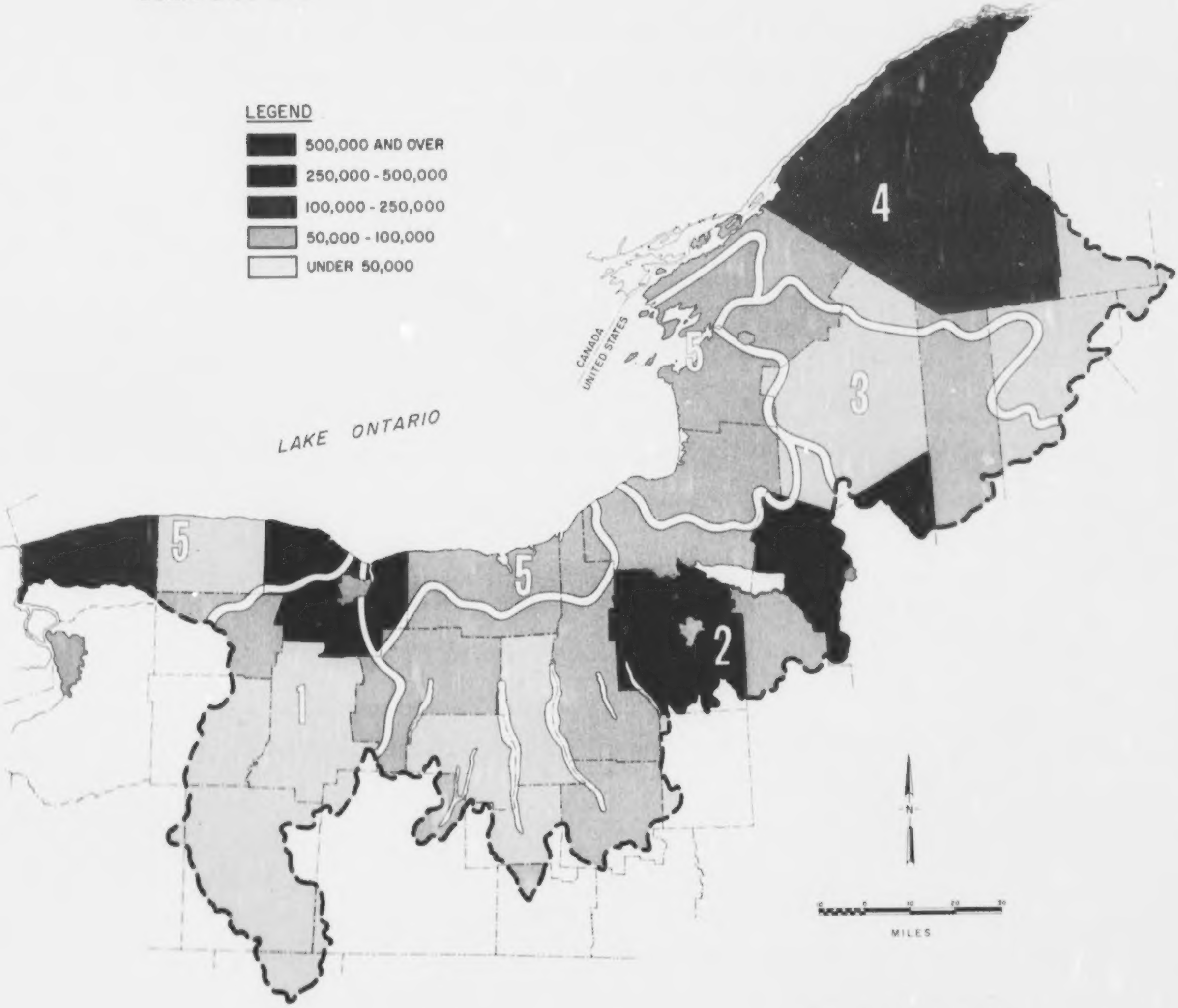
SOCIO-ECONOMIC FACTORS

Resident Population. In 1960 the resident population of the Lake Ontario Basin was 2.0 million (Table No. A-1, Appendix A). The relative distribution of the basin's population shows that most of the populated counties (greater than 50,000) are lake-oriented while nearly every county with a population less than 50,000 lies on the fringe of the basin (Plate No. 2-8).

There are four SMSA's located entirely or partially within the basin. Rochester and Syracuse, the two SMSA's located entirely within the basin, comprise 64 percent of the basin's population. The SMSA's of Buffalo and Utica-Rome are partly in the basin and provide an additional 7 percent of the basin's population. This means that 71 percent of the population resides within the ten designated SMSA counties. Although the urbanized areas within the SMSA's contain less than 2 percent of the total land area of the basin, they account for 43 percent of the basin population.

Three counties within the basin lost population during the period 1940 to 1950, and from 1950 to 1960 a decline occurred in two counties. Of the 29 counties partially or totally within the basin, only Potter County, Pennsylvania, has exhibited a continual decrease in population since 1940. Two-thirds of the counties gained population at an increasing rate in the 1950-60 decade.

Plate No. 2-8


LEGEND
500,000 AND OVER
250,000 - 500,000
100,000 - 250,000
50,000 - 100,000
UNDER 50,000
LAKE ONTARIO
CANADA
UNITED STATES
1
2
3
4
5
5
5
5
N
0
5
10
20
30
MILES

LAKE ONTARIO BASIN

POPULATION DISTRIBUTION

Source: 152, 153, 154

Table No. 2-4 shows the present and projected population of the Lake Ontario Basin. The basin's population is expected to increase 44 percent by 1990 and to nearly double by the year 2020. Three subbasins, Genesee, Oswego, and Small Streams Tributary, will double their 1960 population within the 60-year period. A population gain of 39 percent is expected from 1960 to 2020 for the St. Lawrence Subbasin while the population of the Black Subbasin will probably remain stable.

Table No. 2-4

PRESENT AND PROJECTED POPULATION
OF THE LAKE ONTARIO BASIN
(in thousands)

Subbasin	1960	1990	2020
Genesee	658	940	1,350
Oswego	872	1,240	1,830
Black	74	74	74
St. Lawrence	127	150	178
Small Streams Tributary	250	447	527
Total	1,981	2,851	3,959

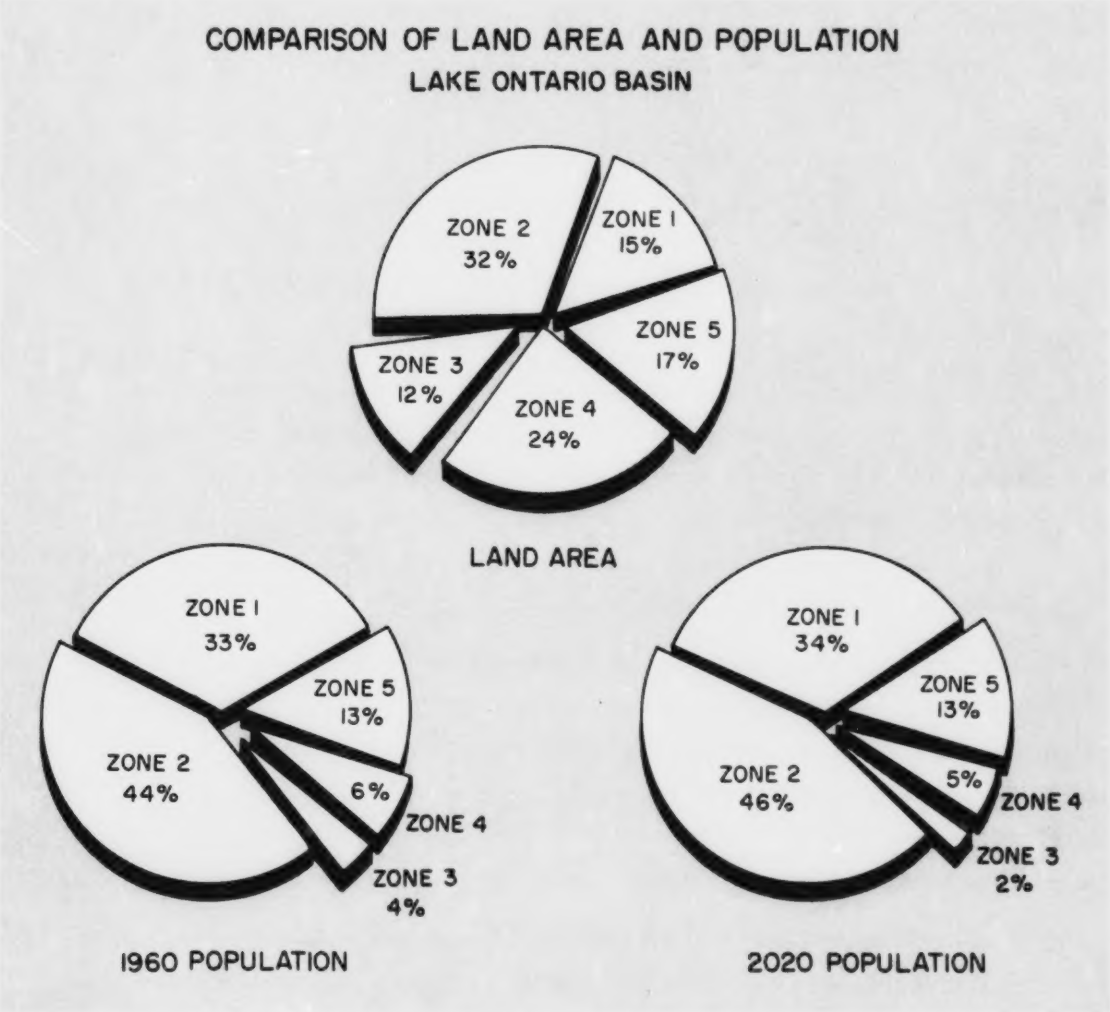
Source: 187, Table A-1.

Zone 2 (Oswego Subbasin) is the largest subbasin in size and the most populous in the basin. By 2020 the population of this subbasin is expected to approach the 1960 population for the entire basin. The next largest subbasin (St. Lawrence or Zone 4) contains only six percent of the basin's inhabitants. Although this subbasin's population is expected to increase 39 percent during the next 60 years, it will contain a relatively lower percent of the basin's projected population in 2020 when compared to other subbasins. Zones 1, 3, and 5 (Genesee, Black, and Small Streams Tributary, respectively) are nearly equal in land area; however, they vary significantly in resident population. Zone 1, which comprises 15 percent of the basin's land mass, accounts for one-third of the population. Thirteen percent of the basin's inhabitants reside in Zone 5 which constitutes

2,783 square miles or 17 percent of the total basin area. The Black Subbasin (Zone 3) is the smallest of the five zones with only 12 percent of the basin's land area, and it presently contains 74,000 people or approximately 4 percent of the basin's population. Since this subbasin's population is expected to remain static during the 1960-2020 period, the population percentage will drop to 2 percent of the basin total by 2020 (Plate No. 2-9).

Income. Income greatly influences the degree to which people participate in outdoor recreation activities. "Outdoor Recreation for America" (107) states

Plate No. 2-9



COMPARISON OF LAND AREA AND POPULATION
LAKE ONTARIO BASIN

". . . participation tends to go up as income does." Per capita income quadrupled nationally during the 1940-60 period. In 1960 it was $2,217, $2,778, and $2,386 for the Nation, the State of New York, and the Lake Ontario Basin, respectively. Monroe County had the highest per capita income ($2,868) in the basin in 1960, while Lewis County, located in the Black River Subbasin, reported the lowest income per capita of $1,720. ORRRC Report No. 23 (112) predicts a national per capita income of $2,941 for 1976 and $4,104 for the year 2000. If a similar trend occurs in the basin, it will continue to exhibit a higher income rate than the Nation.

Leisure Time. In 1959-60 a National study was made to determine the use of leisure time. Of all leisure time activities stated by each respondent, outdoor recreation activities were mentioned one-sixth of the time. Insufficient time was listed as limiting recreational participation by those questioned more than three times as often as income (111). Clawson (15) estimates that outdoor recreation occupies about 7 percent of our leisure time. The amount of leisure time available in the future will largely be determined by labor-management decisions which at best are difficult to anticipate. By 1976 it is estimated that the standard workweek will average 36 hours for the industrial work force as compared to 39 hours in 1960. And by 2000 the average workweek may decline to 32 hours (107).

Mobility. At present, automobile travel heavily dominates the travel scene in this country, including travel for outdoor recreational pursuits. Our national automobile transportation system consists of nearly 60 million passenger cars, 3.6 million miles of roadways, numerous service facilities and accommodations for travelers, special public administrative and regulatory agencies, and supporting production and distribution facilities (112).

The national system of interstate and defense highways was approximately half completed at the end of 1965 with 20,500 miles open to traffic. Of this total, 310 miles of interstate highways are presently open to traffic in the Lake Ontario Basin. In addition to the existing thruways, the New York State Highway Department is planning to construct a major thruway roughly paralleling present State Route 17 along the southern tier of counties (Plate No. 2-10).

From Table No. 2-5, the Lake Ontario Basin has 1.1 percent of the nation's people as well as the nation's automobiles. The basin presently contains 1.5

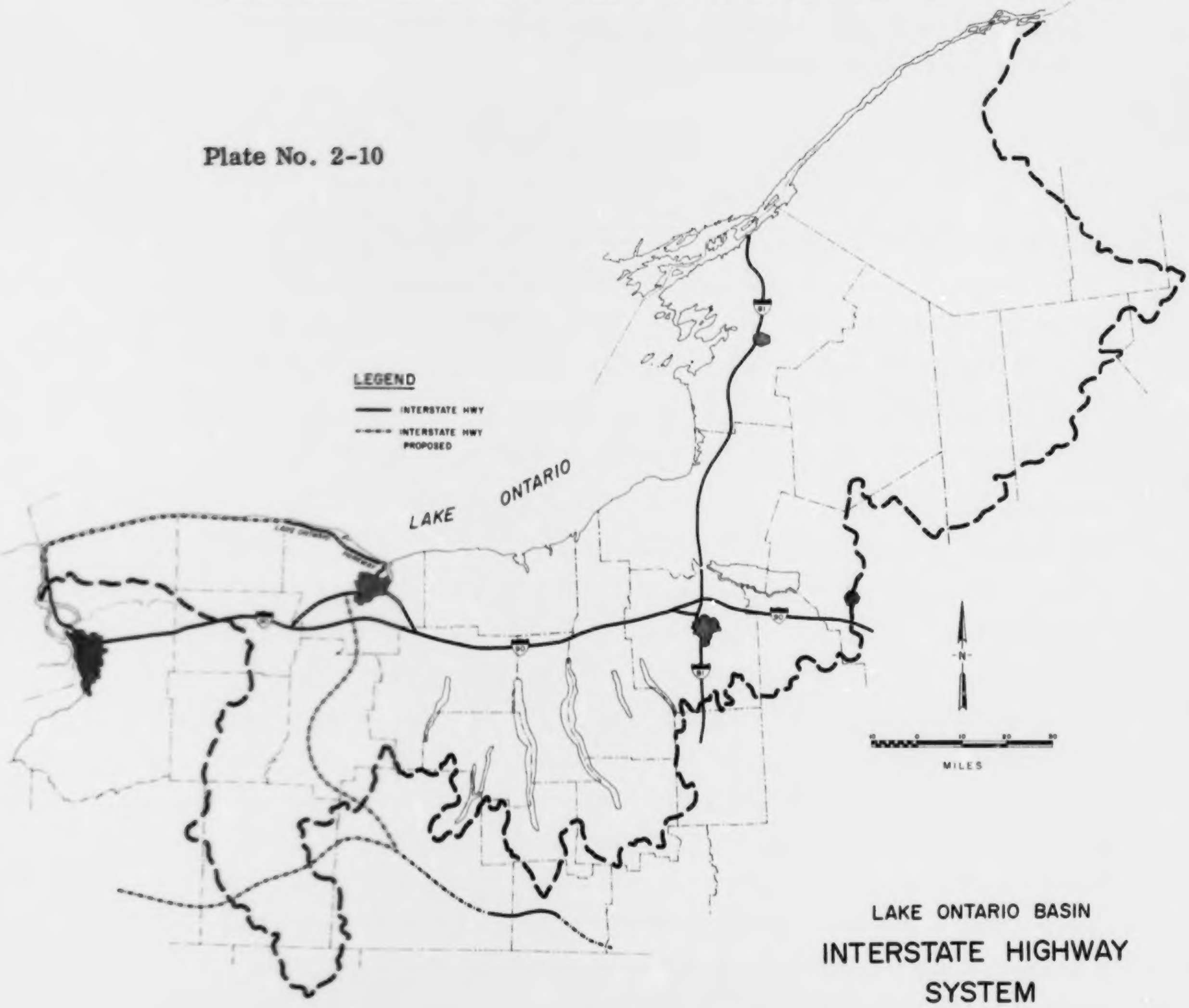
Table No. 2-5

COMPARISON OF U.S.-BASIN AUTOMOBILES PER CAPITA (1960) AND INTERSTATE MILES (1965)

	United States	Lake Ontario Basin	% of Nation
Population	179,323,175	1,980,550	1.1
Number of Automobiles	58,268,031	653,582	1.1
Automobiles Per Capita	0.32	0.33	---
Completed Interstate Miles	20,500	310	1.5

Source: 49, 152

Plate No. 2-10


LEGEND
INTERSTATE HWY
INTERSTATE HWY PROPOSED
LAKE ONTARIO
81
90
N
MILES

LAKE ONTARIO BASIN
INTERSTATE HIGHWAY SYSTEM

percent of the completed national interstate highway mileage. Per capita automobile ownership in the basin is nearly equal to the national rate. Hamilton County has the highest automobile per capita ownership rate with 0.60 cars per person. Six counties (Niagara, Monroe, Tompkins, Onondaga, Oneida, and St. Lawrence) share the lowest per capita rate of 0.31 automobiles per person.

Nationally, air travel is rapidly becoming an important mode of transportation. In 1964 the number of air passengers was more than 81 million, an increase of 14.5 percent over 1963 (49). It is predicted that air transportation will account for more than one-half of all trips over 500 miles in 1976. The SMSA's of the basin have well-developed airport facilities which are served by trunk and feeder airlines. The increasing ease and economy of air travel will tend to attract tourists and vacationists into the basin.

Demographic Characteristics.

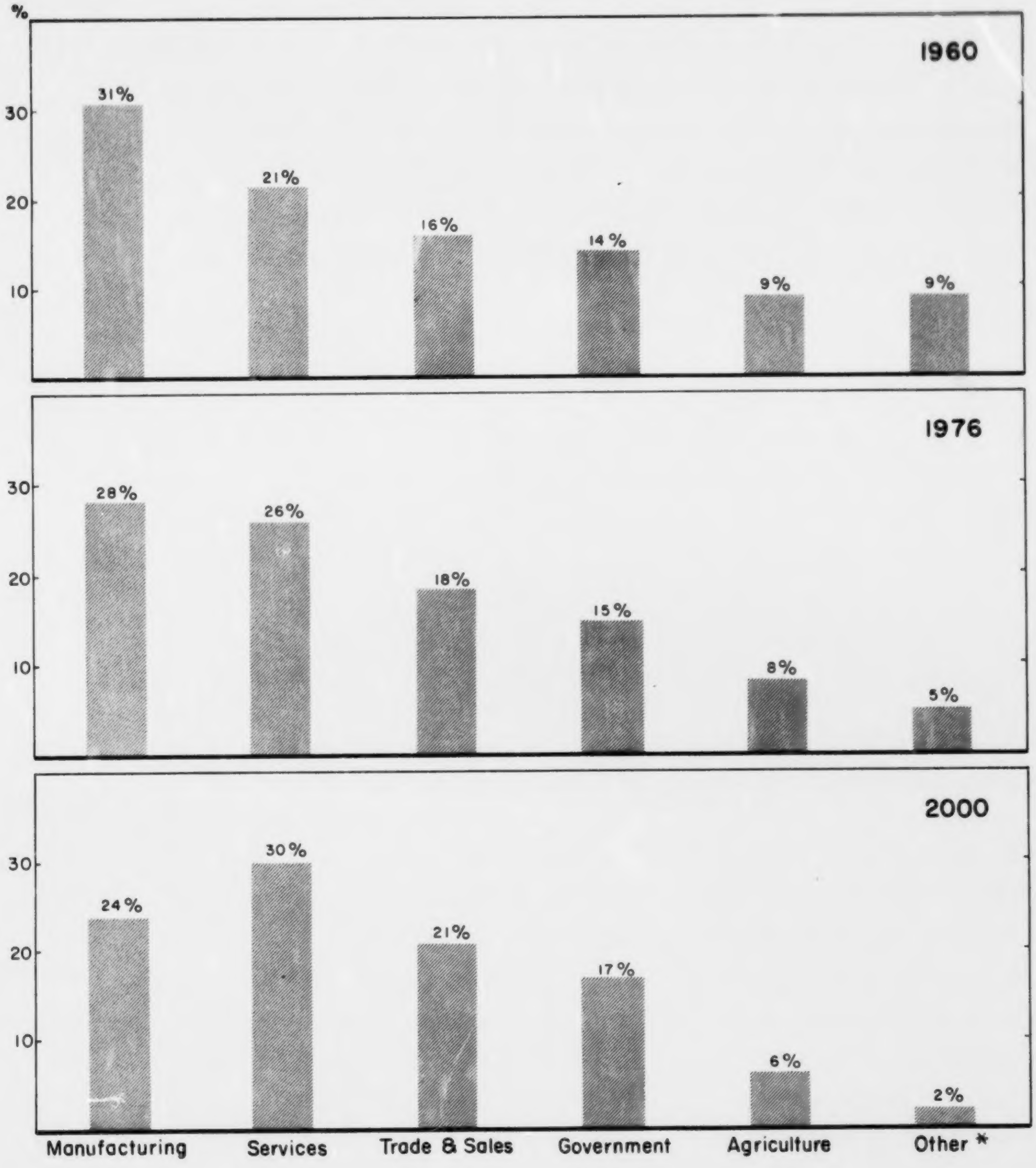
Occupation. Occupations of the basin's inhabitants provide an indication of their propensity to participate in outdoor recreation. For instance, ORRRC Study Report No. 19 lists participation rates for various outdoor recreation pursuits by industrial occupation groups. The graphical representation on page 2-23 shows the present and future distribution of these groups for the basin.

Presently, the manufacturing segment leads the other occupational groups, but by the year 2000 it will relinquish its lead to the services group. Trade and sales and government sectors will make gains at the expense of the agriculture and other categories by 2000. Even though the manufacturing sector will decline relatively in size, it is estimated that income and leisure (in terms of a shorter work week) will continue to accrue to its members at a high level during the next four decades; therefore, participation in recreational activities will remain high for this group. According to "Outdoor Recreation for America", the trade and sales group ranks above the average in outdoor recreation participation, and it appears this trend will continue to the year 2000. The expected increase in the size of the services sector, especially the subgroup of professional and technical personnel, indicates that the average income of employees in this sector will rise, thereby increasing the significance of this group in total recreation demand. Because of long hours and the nature of the work, the agricultural worker has little time and/or

PRESENT AND FUTURE DISTRIBUTION OF INDUSTRIAL OCCUPATION GROUPS

LAKE ONTARIO BASIN

Source: 73, 112



**Includes mining, construction, entertainment & recreation, transportation, communication, utilities, finance, insurance and real estate.*

Plate No. 2-11

interest for additional outdoor activity--thus making a small contribution to the total demand for outdoor recreation. Government and other categories will exhibit gradual increases in income and leisure. These two groups will, at the same time, parallel closely the average in pursuit of outdoor recreation (107).

Urban-Rural Ratio. For comparative purposes, the urban-rural ratio provides an index of spatial location as well as an indicator of expected recreation activity by a given population. The ORRRC Studies (107, 110) reveal that urban people are more active in outdoor recreation pursuits than rural people. Furthermore, suburbanites participate more actively than do persons from the central city. As indicated in the preceding section, rural farm folk have the lowest participation rates. Table No. 2-6 gives an insight into the urban-rural relationship.

Table No. 2-6

PRESENT AND FUTURE URBAN-RURAL RELATIONSHIP
LAKE ONTARIO BASIN

	1960	2000
Population	1,980,550	3,294,000
Percent Urban	63	71
Percent Rural	37	29
Percent Rural Farm*	7	5

*Rural farm is also included in rural sector.

Source: 7 , 112, 187 .

The basin's population is expected to increase 1.67 times by the year 2000. During this period the rural sector will experience an 8 percent drop in the proportion of the total basin's population although it will gain people in absolute terms. Likewise, the rural farm segment will gain residents but lose in proportion of population to the urban sector. In 1960 Monroe County had the highest urban-rural ratio (8 to 1) of all counties in the basin. On the other hand, Hamilton County, situated in the heart of the Adirondack Forest Preserve, has no population classified as urban.*

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*According to the Bureau of the Census definition for "urban place," an area must contain 2,500 inhabitants or more. Hamilton County has no incorporated or unincorporated place this size in the basin.

Age. Assuming other factors are equal, age has a significant influence on participation in certain outdoor recreation activities. Older people tend to engage in less outdoor activity than younger persons. This is particularly noticeable in such active pursuits as water skiing, hiking, camping, etc. (107). The Lake Ontario Basin has a median age of 30.2 years as compared to the national median of 29.5 years (73). The table below shows the present and future distribution of age groups in the basin.

The 15-34 age group is the most active in outdoor recreation pursuits (110). As Table No. 2-7 shows, this group will increase in proportion to the total population while the next older category will decline. This shift can be attributed to (1) the advancement of individuals in the two younger groups into the middle aged group and (2) a large increase in population for the next 20 years.

Table No. 2-7

PRESENT AND FUTURE AGE DISTRIBUTION
LAKE ONTARIO BASIN

Age Group	1960	2000
Under 15	31%	31%
15-34	25%	30%
35-64	34%	29%
65-and over	10%	10%

Source: 112, 153.

Education. Education affects participation in outdoor recreational pursuits in much the same way as income, i.e., the higher the educational attainment, the greater the participation tends to be. This is particularly true in the case of swimming, playing games, sightseeing, and walking and driving for pleasure (107).

Table No. 2-8 indicates that the number of adults completing one or more years of college in the basin is somewhat below the national level. According to more recent evidence, a change in this relationship may be occurring. In the past five years, the full-time college student enrollment at state institutions in New York has more than doubled. The State University of New York system has 58 colleges and centers distributed throughout the State. Sixteen of these units are located in the basin. The enrollment at these 16 state colleges and centers, from an

Table No. 2-8

COMPARISON OF U.S.-BASIN
LEVELS OF EDUCATIONAL ATTAINMENT-1960
(persons 25 years and over)

	United States	Lake Ontario Basin
Median School Years Completed	10.6	10.6
Percent completed one or more years of college	16.5	15.0

Source: 73, 152

approximate 13,000 students in 1960, will climb to an estimated 46,000 by 1970 (23). This jump in enrollment indicates an increase of 252 percent in a 10-year period. If this forecast materializes, the future level of educational attainment for the Lake Ontario Basin will in all probability exceed that of the nation. Consequently, this tremendous collegiate educational thrust will have a direct impact upon the demand for outdoor recreational facilities in the basin.*

Vacationing Population. An estimated 2 1/4 million vacationists come to the Lake Ontario Basin annually for the main purpose of outdoor recreation (derived in Appendix B). This approximation includes all vacationists who spent 4-30 days in the basin.

These vacationists spend an average of $63 per person while in the basin. Their average length of stay is 6.4 days and the average size of their party is 3.7 persons. The typical tourist:

- probably lives in New York State or one of the nearby states.
- makes his vacation visit in June, July, or August, although he shows interest in the fall months.
- patronizes hotels and motels in his travels but is just as likely to stay with a friend or relative.
- drives the family car on his vacation trip (76b).

Another segment of the vacationing recreation population to be considered is the summer resident. Unpublished data supplied by the New York State Travel Bureau indicate that in 1960, there were 37,500 seasonal vacation homes in the basin (76c).

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*Assuming those who obtain collegiate training stay in the basin or if they move upon completion of their schooling return to the basin for vacations.

The largest concentration of these homes is in the counties along Lake Ontario itself. Jefferson County has over 5,600 seasonal vacation homes while St. Lawrence, Wayne, Ontario, Oswego, and Cayuga counties have 2,000 or more homes. Most of the summer resident home owners have cottages or cabins adjacent to bodies of water.

Economic Importance of Recreation Travel. An attempt has been made to assess the significance of recreation travel upon the economy of the basin. As Table No. 2-9 shows, approximately 273 million dollars are spent annually by recreationists in the Lake Ontario Basin. Of this total, an estimated $142 million is spent for recreational travel by vacationists. Using Rathmell's pattern of dollar sales distribution (124), an estimate of recreation travel spending was derived for the three groups. Permanent residents are considered to be those who actively participate in outdoor recreation activities overnight and on weekends. Summer residents could also be permanent residents of the basin as well, but these two groups were categorized to obtain an indication of the economic impact that recreation plays in the basin's economy.

Table No. 2-9

AMOUNT OF EXPENDITURES FOR RECREATION TRAVEL
LAKE ONTARIO BASIN-1960

Source of Recreation Expenditures	Group Size (thousands)	Percent of Dollar Sales	Amount of Expenditures (millions of dollars)
Permanent Residents	1,981	38	104
Summer Residents	225	10	27
Vacationists	2,251	52	142*
Total	4,457	100	273

*Obtained as follows: 2 1/4 million times $63 (average amount vacationist spends on vacation) equals $142 million. The other two figures in the last column are based as a proportion to the 52:142 ratio.

Source: 76b, 76c, 124

Advertising. Aside from personal knowledge and recommendations of friends and relatives, the typical traveler makes his decision about vacations through various advertising media. An indispensable requisite for the production of increased travel revenue for any area is an effective advertising and promotional program. In New York State this responsibility rests with the Travel Bureau, a state agency in the Department of Commerce.

New York is the most popular vacation state in the nation and commands 11 percent of the domestic travel business (56). Through the cooperation of the state's regional tourist associations, chambers of commerce, industry, and the tourist and resort people themselves, New York State has been a leader in the travel promotion field. Over a million copies of "New York State Vacationlands," the annual tourist publication prepared by the Travel Bureau, were disseminated in 1965. Seventy-two percent of the people who requested this publication actually spent vacation time in New York State (76b). "New York State Vacationlands" and regional pamphlets such as "Finger Lakes Travel Guide" are instrumental in promoting the Lake Ontario Basin as a vacation mecca.

Chapter 3
Demand

RECREATION MARKET AREA

By definition the recreation market area is that area from which approximately 80 percent of the people are drawn on one-day outings or weekend (overnight) trips to the program area under consideration. In terms of the Lake Ontario Basin, a modified recreation market area was adopted because much of the area that normally would be considered in the recreation market area was included in the recently completed Lake Erie Basin report (184). Since many additional areas would need to be considered, valuable time and space would be spent in duplicating this report at the expense of basin area evaluation. Hence, the existing and potential water recreation resources in the belt around the basin were not considered. However, in developing the modified recreation market area, the influence of people outside of the basin on recreation demand within it was considered. This outside influence was represented through calculation of the influence on the recreation demand of SMSA populations within a 125-mile radius of the basin.

METHODOLOGY

Recreation demand is an expression of total participation in general outdoor recreation activities that could be expected if adequate opportunities were available. Demand, therefore, comprises two components: (1) the expressed demand represented by use of existing facilities and (2) the latent or unexpressed demand which is inherent in a population but not reflected in the use of existing facilities. Generally speaking, use records are inadequate or unreliable for many of the recreation facilities operated by local units of government. Latent demand, on the other hand, is not directly measurable because of its dependence on the individual desires of people. Consequently, indirect methods have been used for the measurement of present and future demand (176).

In the analysis of the recreational demand in the basin, it was found that the ORRRC studies presented the most applicable information. The methodology employed in determining demand is described in Appendix B. This method utilized participation rates which facilitate estimating the number of occasions a person will participate in various activities during a year. Since participation is at its peak for most water-oriented activities during the summer, activity occasions were determined for the three-month summer period as well. The demand placed on the recreational resources of the basin was evaluated for the modified recreation market area and for the vacation sector.

Outdoor recreation activities considered in this report include:

Water-Dependent	Water-Enhanced	Winter Sports
Swimming	Camping	Ice Skating
Fishing	Picnicking	Snow Skiing
Boating	Sightseeing	Sledding
Water-skiing	Nature Walks	
Canoeing	Hiking	
Sailing	Hunting	

These activities are obviously not all the recreational activities engaged in, but they represent those considered most important in association with water and water quality. In the case of winter sports, the three listed activities were selected for their expected expansion and probable effect upon headwater areas.

INFLUENCING FACTORS

Socio-Economic. The present and future demand for outdoor recreation opportunities is dependent upon a number of continually changing socio-economic factors. Carlson, et al., (13) indicate seven factors that may influence future recreation demands, namely: (a) automation and new sources of power, (b) increased leisure, (c) increased income, (d) greater health and longevity, (e) a higher standard of living, (f) greater mobility, (g) population changes.

As presented in the preceding chapter, the basic socio-economic factors considered in the recreation demand analysis are population, income, leisure, and mobility. Individually, these factors contribute substantially to the total demand picture, but when viewed collectively, there exists an interrelationship of dynamic proportions. Other factors supplement these socio-economic characteristics, but the extent to which each directly affects the demand for outdoor recreation depends largely upon the influences exhibited by each resource area.

Opportunity. If the opportunity for participation in a selected activity is available, people will tend to participate more than they would otherwise. When opportunity to participate in any of the selected activities exists to some extent somewhere in the basin, the opportunity factor is represented by a time-distance element which is discussed in the demand methodology in Appendix B.

Quality of Facilities. Closely allied with the opportunity factor is the quality of the available facilities. Results of a survey discussed in ORRRC Study Report No. 20 infer that participation in most activities tends to increase in proportion to the quality of the supporting facilities. In some instances, this relationship is weakened when the recreational pressures become so great that relatively poor quality facilities receive heavy use.

PRESENT DEMAND

Table No. 3-1 shows that there are over 87 million activity occasions of demand within the Lake Ontario Basin. Of this annual recreation demand computed for base year 1960, approximately 72 percent was devoted to summer recreation activities. Water-dependent activities comprise nearly 43 percent of the yearly demand total and slightly over one-half of the total summer demand.

The figures shown below are a consolidation of the demand estimates for the modified recreation market area and for the vacation sector. See Table Nos. B-1 and B-2 in Appendix B for a detailed breakdown by activity and by sector. Annual and summer demand by outdoor recreation activities is graphically portrayed in Plate No. 3-1 and Plate No. 3-2.

Table No. 3-1

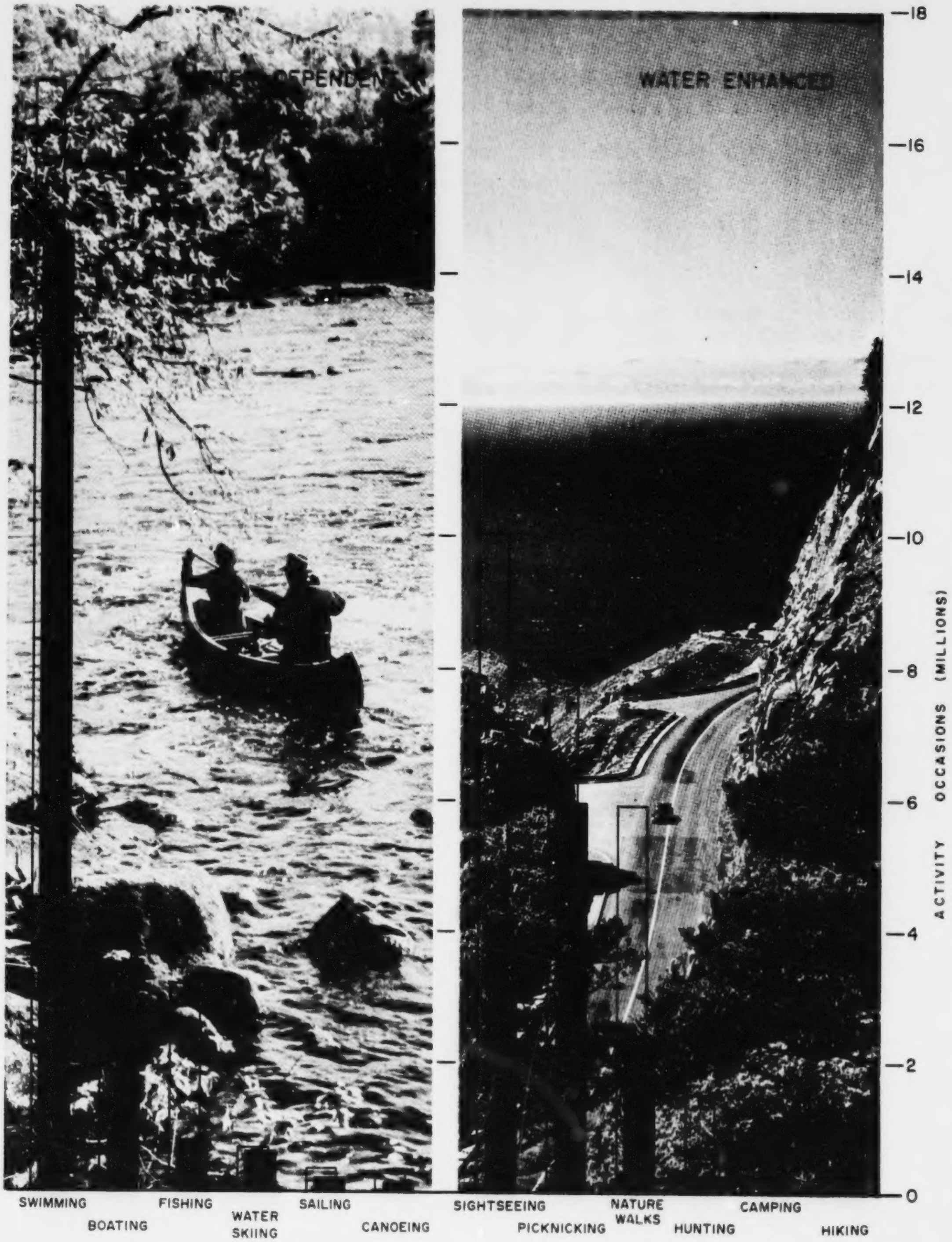
SUMMARY OF WATER-ORIENTED RECREATION DEMAND
LAKE ONTARIO BASIN, 1960

Activity Type	Annual Activity Occasions (1,000)	Summer Activity Occasions (1,000)	Summer as a Percent of Annual
Water-dependent	37,339	32,221	86
Water-enhanced	45,085	30,918	68
Winter sports	5,294	n.a.*	--
Total Water-Oriented	87,718	63,139	72

* Not applicable.

Assuming the average person participates in 2.5 activities during an average visit to a recreational area, demand was converted from activity occasions to recreation days. The total water-oriented demand in the Lake Ontario Basin for 1960 would be:

Summer	25,255,600 recreation days
Annual	35,087,200 recreation days



Present Estimated Demand

LAKE ONTARIO BASIN

☐ ANNUAL
■ SUMMER

Source: Table B-1

Plate No. 3-1

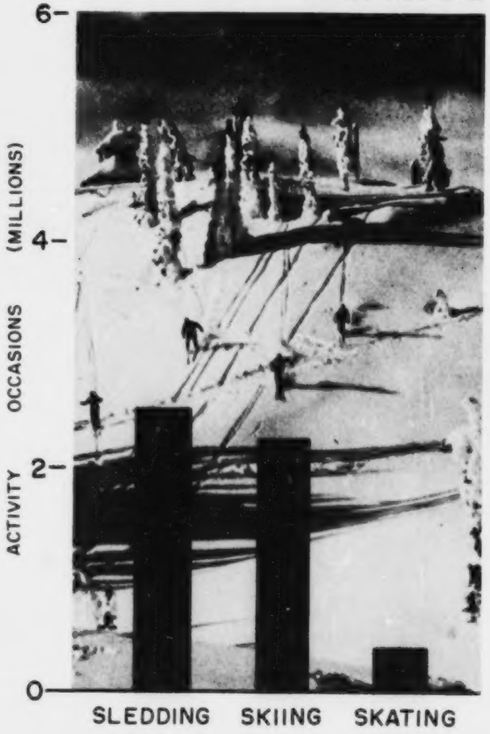
FUTURE DEMAND

Demand for recreational activities within the basin has been projected to the year 2020. Using ORRRC Study Report No. 26 as a source for future demand projections, it was necessary to extend data for the years 1976 and 2000 to obtain projected demand figures for the year 2020. Both "with" and "without" opportunity projections were calculated in order to present a range of probable activity occasions for water-oriented activities (see Table No. B-3, Appendix B). "With" opportunity (as defined in ORRRC Study Report No. 26) assumes an improvement from 1960 quality and quantity of facilities on a per capita basis, while "without" opportunity assumes a continuation of 1960 quality and quantity of facilities. These terms are applied nationwide and are relevant to the specific quality and quantity of facilities offered by public agencies within the basin. The use of these terms offers an opportunity to present a range in projecting recreation demand.

Based on the information shown in Table No. B-3, it is anticipated that the summer demand for outdoor recreation activities will increase 3.09 and 4.14 times by 2000 and 2020, respectively, providing there will be a continuation of 1960 quality and quantity of facilities.

If an improvement in present conditions occur, the three-month demand will increase 3.84 times by 2000 and 5.28 times by the year 2020. See Plate No. 3-3 for a graphical presentation of the expected summer demand by activities.

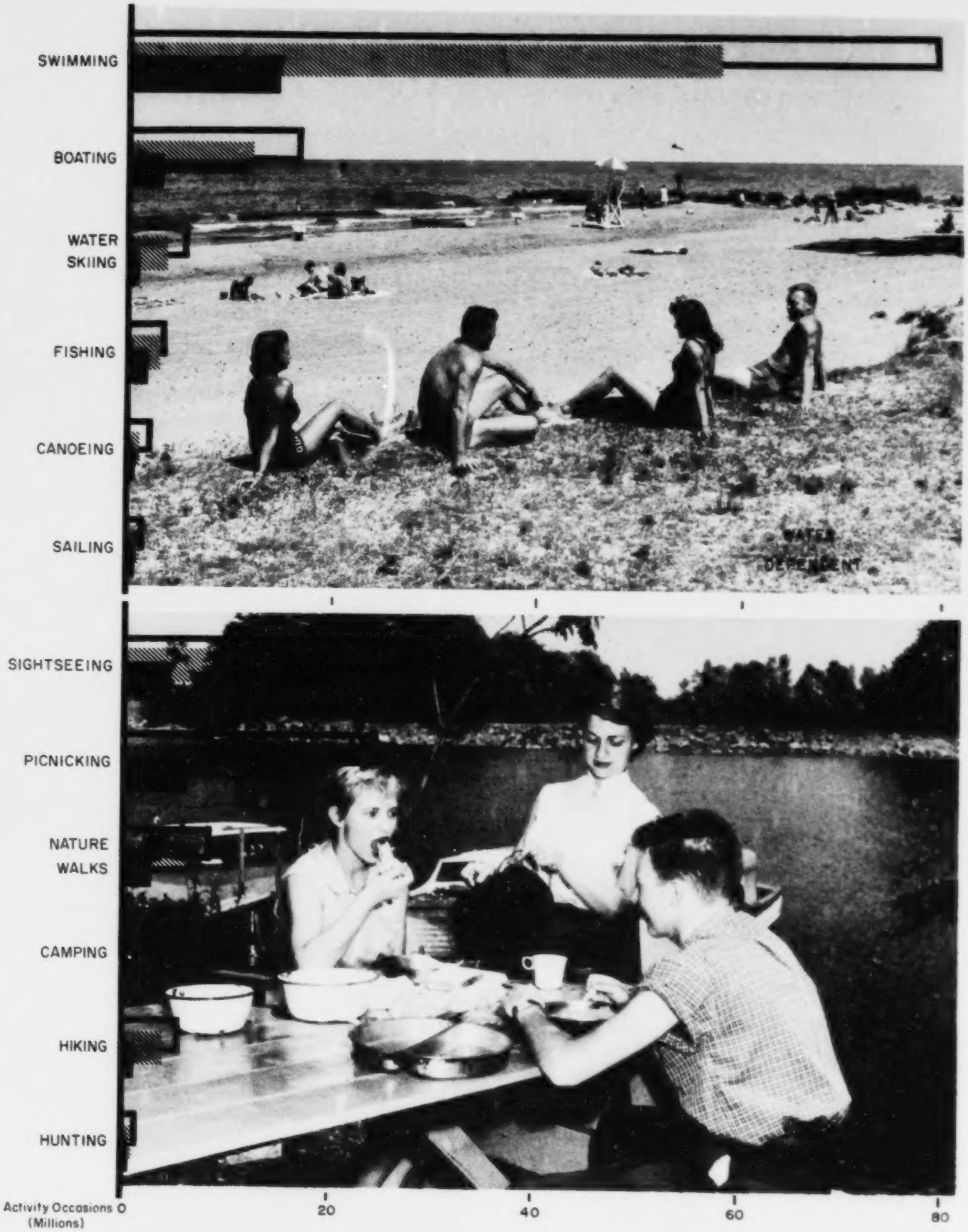
Plate No. 3-2



Present Estimated Demand

Source: Table B-1

The following table shows projected demand for the Lake Ontario Basin.



Source: Table B-3

Plate No. 3-3

Future Estimated Summer Demand

LAKE ONTARIO BASIN

☐ 2020
▨ 2000
■ 1960

Table No. 3-2

PROJECTED SUMMER OUTDOOR RECREATION DEMAND

	Activity Occasions (millions)		Index of Change	
Year	Without Opportunity	With Opportunity	Without Opportunity	With Opportunity
1960	34	34	100	100
2000	106	132	309	384
	142	181	414	528

Source: Table No. B-3, Appendix B.

ZONE DEMANDS

An attempt was made to disaggregate the basin demand for outdoor recreation activities into the five subbasins. A method similar to that used for finding the basin demand was utilized; viz, an income index was derived in order to gain an estimate of the propensity for participation in the respective zones. State park attendance figures as well as the number of seasonal homes in each subbasin were also used in determining the demand for each zone. An explanation of this procedure is found in Appendix B. The results of the zone calculations are shown in the table below.

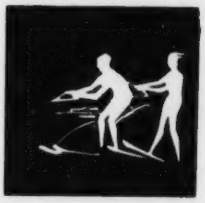
Table No. 3-3

SUMMARY OF ZONE DEMANDS, 1960
(activity occasions - thousands)

	Market Area Demand	Vacation Demand	Total Demand	Percent of Basin
Zone 1	12,341	5,211	17,552	20
Zone 2	24,094	11,436	35,530	41
Zone 3	1,763	1,882	3,645	4
Zone 4	3,526	4,198	7,724	9
Zone 5	17,042	6,225	23,267	26
Totals	58,766*	28,952**	87,718	100

* Total of Column 4, Table No. B-1.
**Total of Column 3, Table No. B-2.

Chapter 4
Supply



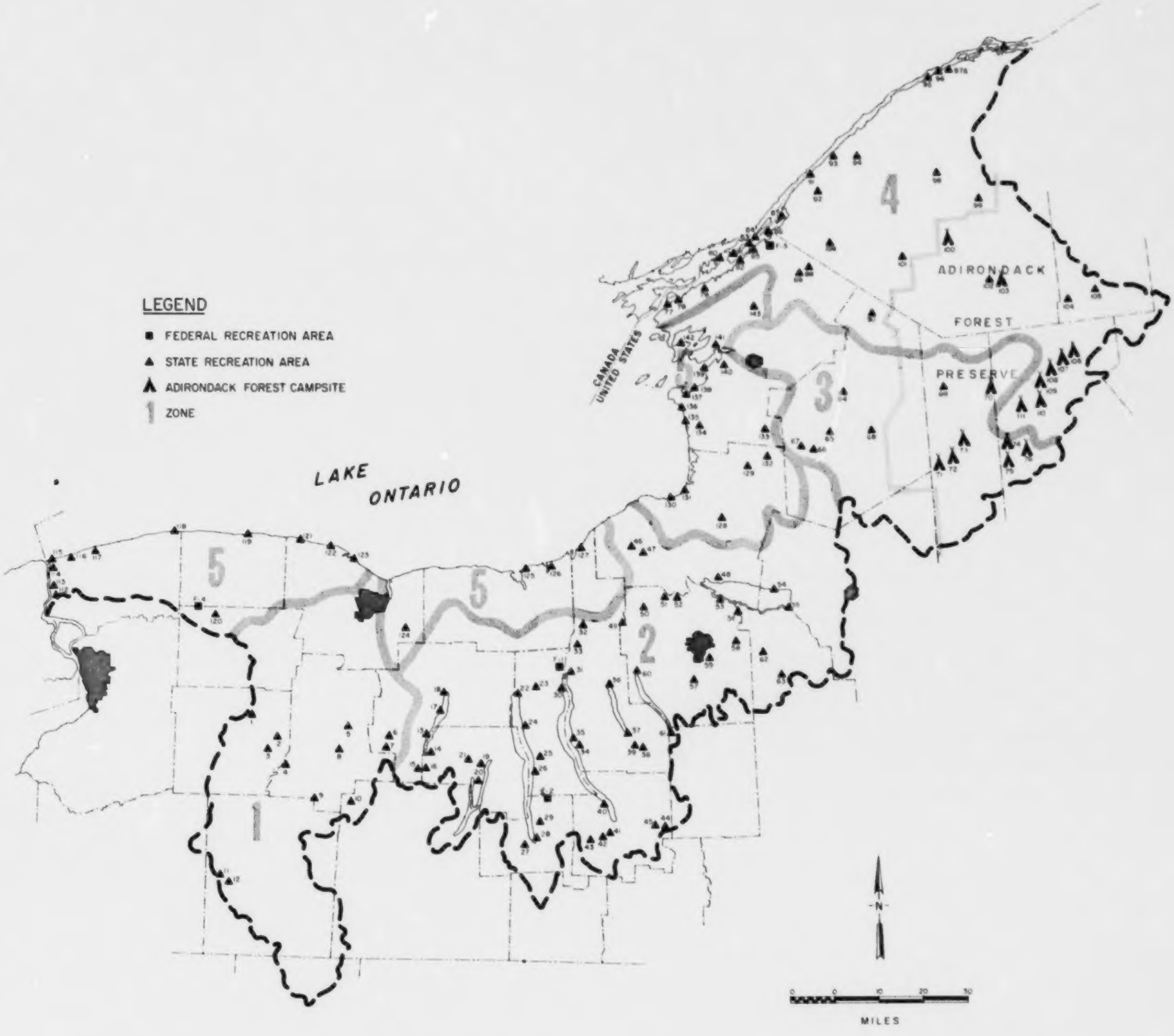
PRESENT RECREATION USE OF THE BASIN'S RESOURCES

In Chapter 2, the recreation resource base of the Lake Ontario Basin was discussed for each subbasin. The mix of many factors--cool summers, beautiful inland lakes, sand beaches, inland water courses, glens and waterfalls, mountains and forests, and interesting flora and fauna--enhances the physical environment and makes the basin a popular summer vacationland. Also, the amount of snowfall and varied topography combine to create an inviting winter setting for skiing and tobogganing.

The majority of the basin's population must rely upon public parks and recreation areas for satisfaction of its recreational needs. The primary restriction on the use of the public resources is one of limited access. Many cottage owners, private club members, and quasi-public organizations have provided their own facilities near or adjacent to bodies of water. Generally, this group does not exert as great a pressure on public areas as does the general public.

There are 183 designated public outdoor recreation areas in the basin with 25 percent yet to be developed. The largest portion (37 of 46 areas) of the undeveloped public areas are administered by the New York State Division of Lands and Forests and Division of Fish and Game. Privately owned and managed facilities designed for public use such as campgrounds, group camps, and vacation farms number approximately 175. Although these private outdoor recreation enterprises are nearly as great in number as the public areas, they comprise only 4 percent of the total outdoor recreation land area of the basin. The inventory reveals that 86 percent of the recreational lands of the basin are administered by four New York State agencies. Relatively minor in terms of total acreage administered are Federal and local agencies which manage 6 percent and 4 percent of the recreation land, respectively. However, most of the local recreation areas are strategically located county parks that serve the pressing day-use needs of the cities and towns of the basin. A detailed inventory of the recreation supply appears in Appendix C while Plates No. 4-1 and 4-2 illustrate the general location of the public areas.

Plate No. 4-1

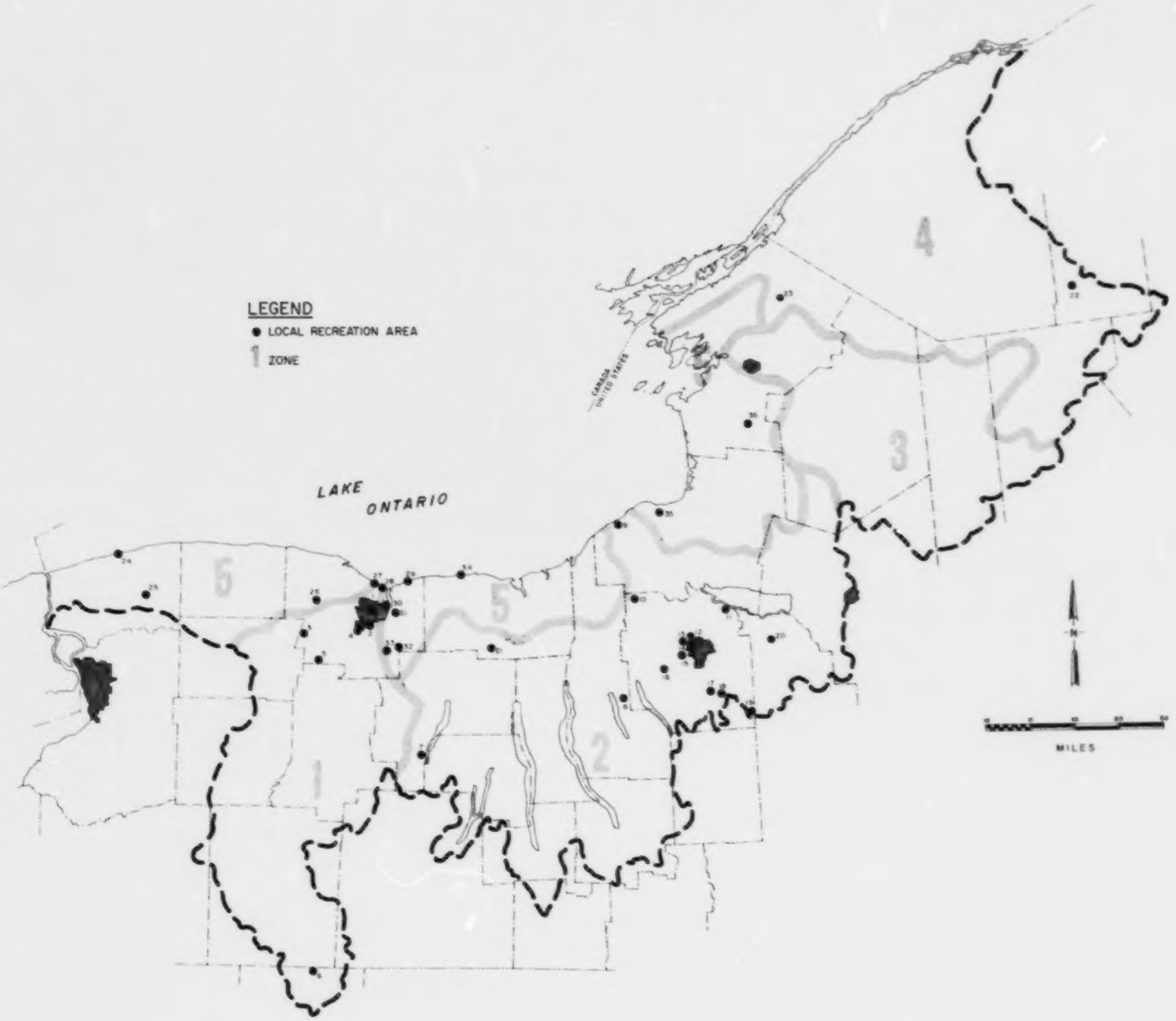

LEGEND
■ FEDERAL RECREATION AREA
▲ STATE RECREATION AREA
⋀ ADIRONDACK FOREST CAMPSITE
ZONE
LAKE ONTARIO
CANADA
UNITED STATES
ADIRONDACK FOREST PRESERVE
1
2
3
4
5
5
N
0
10
20
30
MILES

LAKE ONTARIO BASIN

EXISTING FEDERAL AND STATE RECREATION AREAS

Note: See Appendix C for area identification.

Plate No. 4-2


LEGEND
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LAKE ONTARIO BASIN

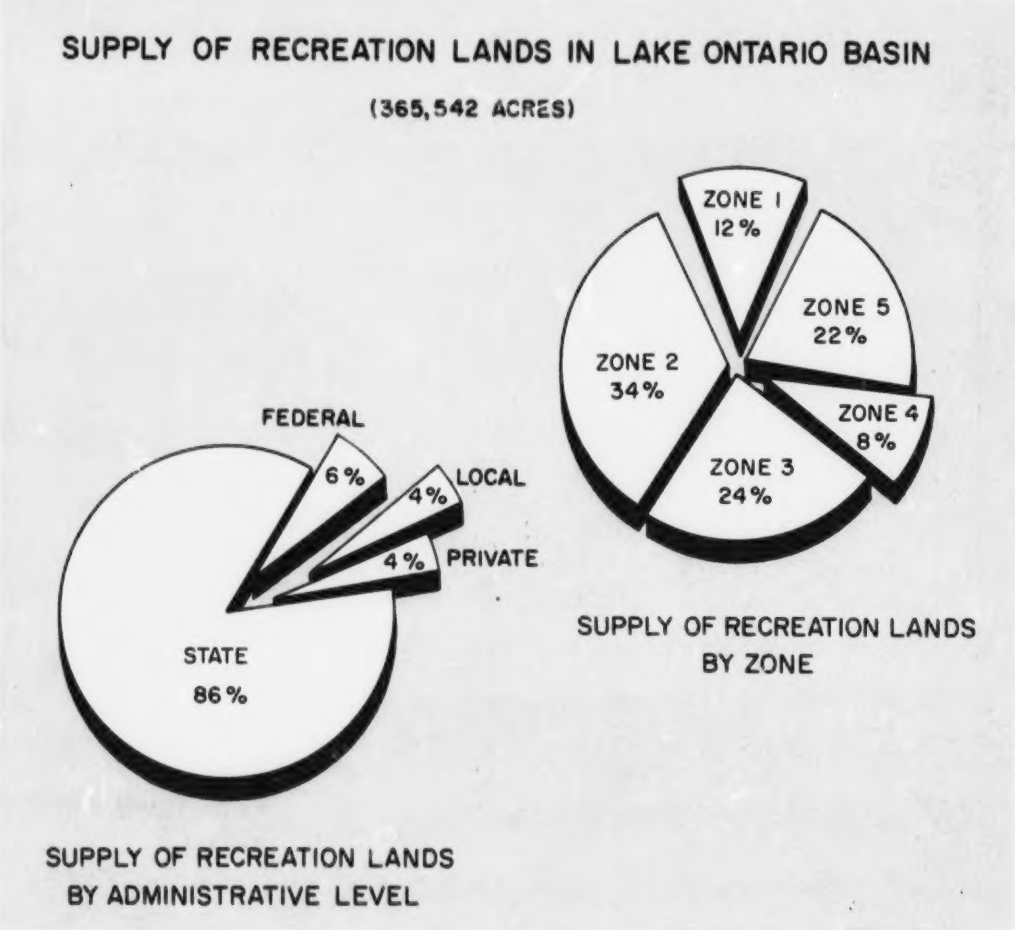
EXISTING LOCAL RECREATION AREAS

Note: See Appendix C for area identification.

Table No. A-3 in Appendix A contains a statistical summary of the supply of outdoor recreation areas in the basin by zone and administrative level. A zone allocation of all the basin's recreation land is also graphically portrayed in Plate No. 4-3. With the exception of Zones 2 and 4, the distribution of recreation resource land is fairly equitable.

As indicated in Table No. A-3, there exists over 365,000 acres of land and water available to the general public for recreation in the 358 areas considered. Seventy-nine percent of these areas provide water-dependent facilities. It must be realized that the total land area under consideration is not all available for general recreational use. Much of it has been left untouched for the purpose of providing buffer

Plate No. 4-3



zones and for the provision of activities that are by nature extensive in their use and enjoyment. Where consistent with recreation use objectives, this is definitely a recommended practice.

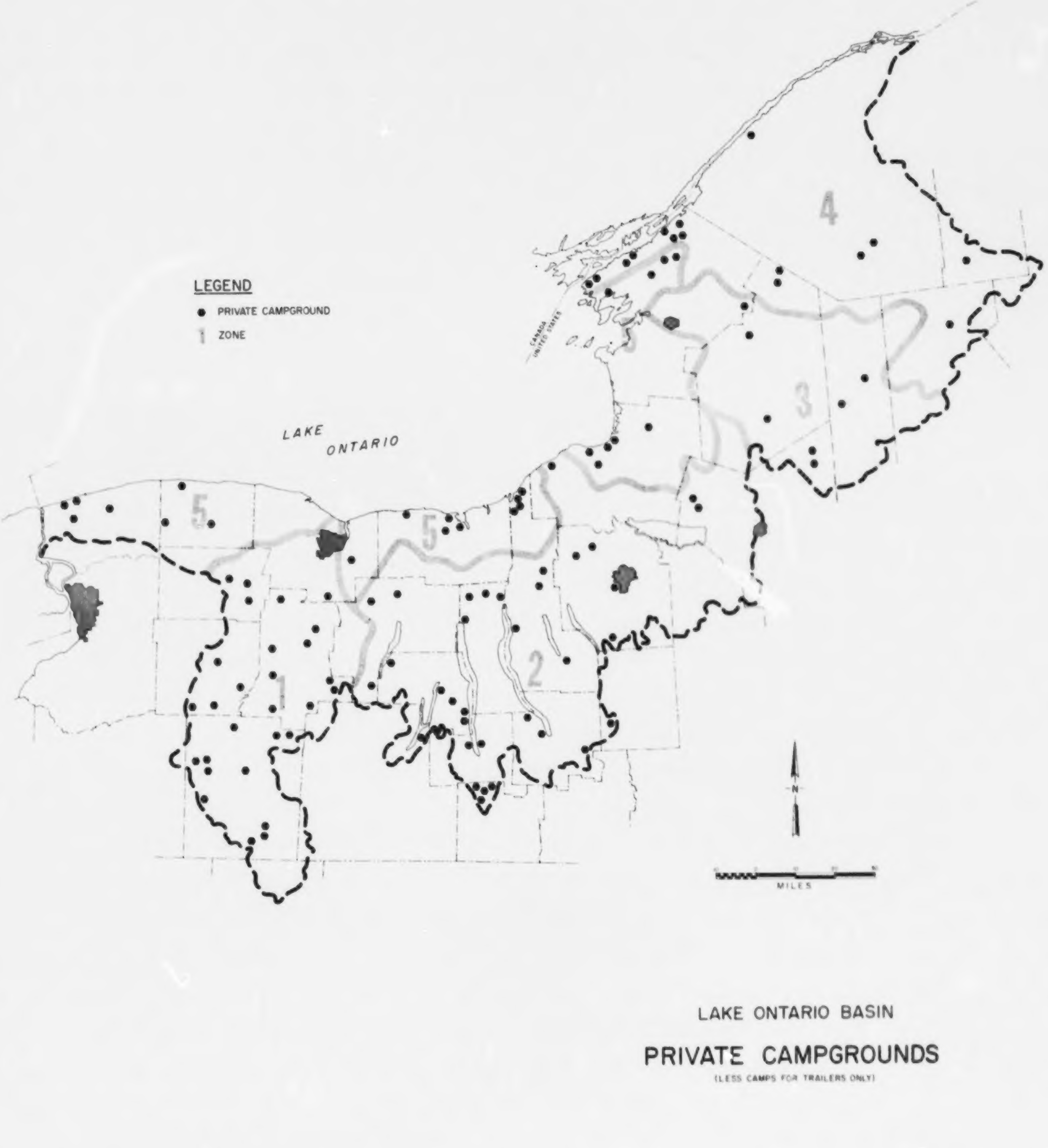
Where public resources and facilities are limited, the private sector contributes significantly to the total supply of outdoor recreation resources. Insufficient data makes it impossible to evaluate specifically the private sector's effect on the basin's total outdoor recreational picture. Nevertheless, private recreation facilities open for public use were inventoried and analyzed. The segment of the private sector most difficult to assess comprises such private developments as cottages, clubs, resorts, hotels, motels, and marinas. Needless to say, in localities where public resources are limited, the importance of the private sector is substantially greater.

Of the 175 private recreation areas considered, 91 percent provided water-dependent activities. The remaining 16 areas are private campgrounds located near state parks which have water-dependent activities or are adjacent to the basin's interstate highways and thruways.

Improper management, lack of advertisement, and often inability to secure sufficient funds for capital investments serve to diminish the attractiveness of private recreation development. As a result, the situation increases competition for space in developed public areas. Despite its problems, the private sector will, without doubt, remain an important asset in providing outdoor recreation opportunities. With the extremely diversified interests of the general public, specialized pursuits are many. Oftentimes, the provision of marinas, winter sports areas, and outdoor amusement facilities is not considered to be in the realm of the public sector, and it is, therefore, highly advantageous that the private sector be encouraged to provide the desired facility.

The National Association of Soil and Water Conservation Districts, in cooperation with the Soil Conservation Service, has recently completed a detailed inventory of private recreation enterprises. Table Nos. A-4 and A-5 in Appendix A were in part derived from this data. Plate No. 4-4 and Plate No. 4-5 show the distribution of private campgrounds and of organizational group camps.

Plate No. 4-4

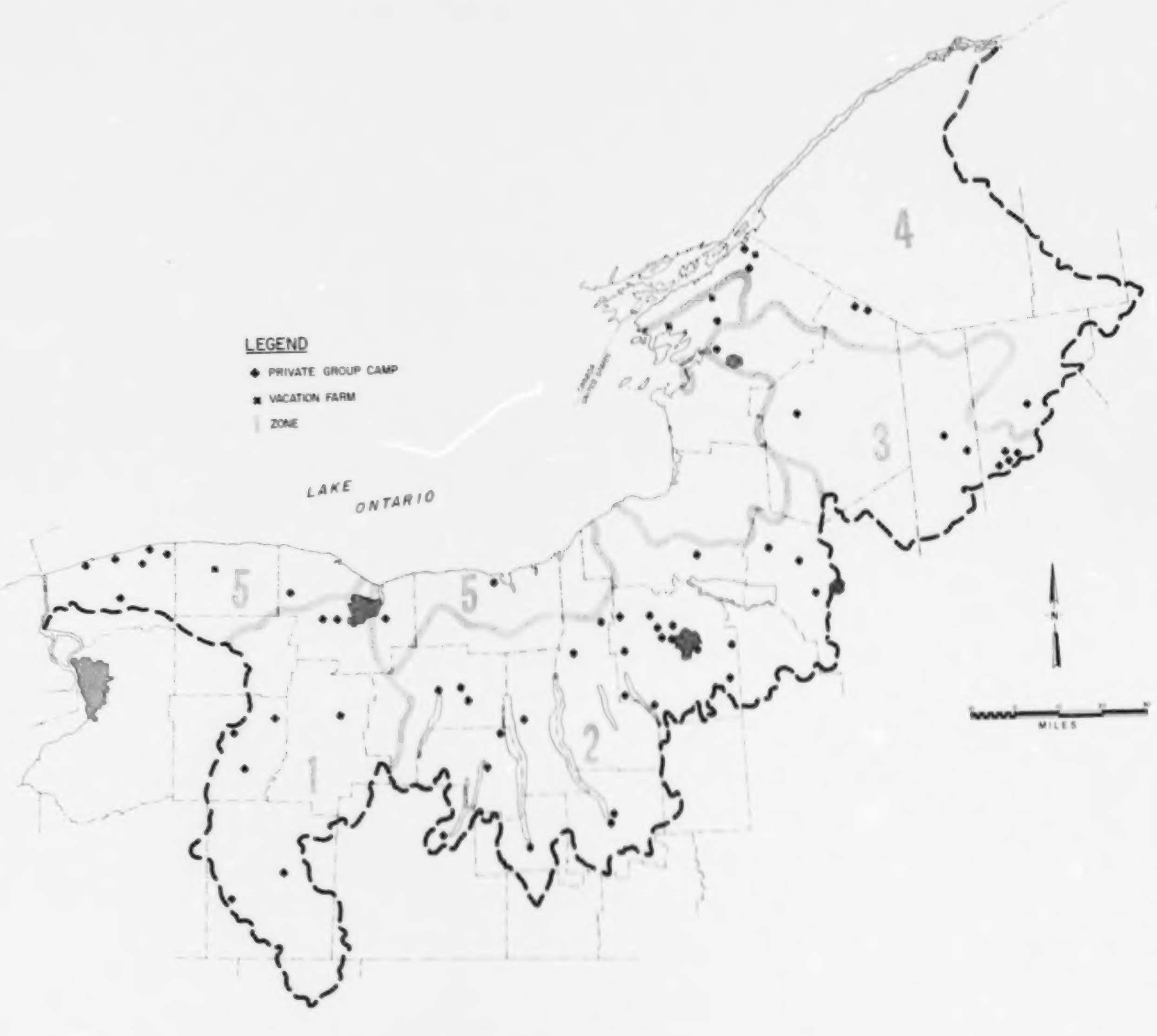

LEGEND
● PRIVATE CAMPGROUND
1 ZONE
LAKE ONTARIO
CANADA
UNITED STATES
1
2
3
4
5
5
N
MILES

LAKE ONTARIO BASIN

PRIVATE CAMPGROUNDS

(LESS CAMPS FOR TRAILERS ONLY)

Source: 6, 7, 9, 71, 72


LEGEND
◆ PRIVATE GROUP CAMP
■ VACATION FARM
ZONE
LAKE ONTARIO
1
2
3
4
5
5
MILES

LAKE ONTARIO BASIN

PRIVATE GROUP CAMPS

(LESS DAY CAMPS)

Source: 3, 4, 26, 62, 97

Genesee Subbasin. Most of the public and private recreation developments are found in the lower and central portions of the Genesee Subbasin. Public recreation developments in particular are of good quality and are extremely popular. The expenditures of people using the recreation facilities provide a major source of income to the inhabitants of many small communities in Wyoming, Livingston, and Ontario Counties.

Fifty-six areas, totalling 43,392 acres, are available for public recreation use in this subbasin. State-owned properties constitute 70 percent of the recreation lands of the subbasin while Federal, private, and local areas comprise 15 percent, 10 percent, and 5 percent, respectively.

There are four state parks in the Genesee Subbasin. Letchworth State Park, named for W. P. Letchworth who devoted a large part of his life to preserving the natural features of the 17-mile Genesee Gorge, is one of the outstanding scenic areas in the New York State Park System (68). Visitor attendance in 1966 exceeded 700,000--more than double the 1948 visitation figure (81). Other state parks in this subbasin are Stony Brook State Park, Silver Lake State Park, and Cuba State Park. Their combined attendance reached nearly 210,000 visitors in 1965. Stony Brook, a scenic 554-acre state park near Dansville in the east central part of the subbasin, has had a 62 percent increase in visitation during the 1950-65 period. Silver Lake and Cuba State Parks are being developed and, as such, have very limited accommodations. The remaining state areas are Multiple Use Areas (MUA), State Reforestation Areas (SRA), Game Management Areas (GMA), and boat launching sites--most of which have little or no developed facilities. However, these areas provide opportunities for extensive recreation experiences, including hunting, fishing, hiking, and nature study.

Primarily serving the urban day-use needs of the Rochester SMSA is the Monroe County Department of Parks. Of the thirteen park areas comprising the system, five are located within the Genesee Subbasin. The other eight parks are located in the drainage basins of the Small Streams Tributary (Zone 5) to Lake Ontario. Three of the five county parks in the subbasin have water-dependent activities; one county park, Oatka Creek, is undeveloped. Total visitation in 1963 to the four developed parks exceeded 2.2 million.

Private enterprise has developed a variety of recreation facilities and accommodations for tourists and vacationists, including group camps, campgrounds, resort hotels and motels, vacation homes, and tourist homes. The shorelines of the "Little Finger Lakes" are largely taken up with these various private developments, particularly summer cottages. Twenty-eight private campgrounds with an average of 75 sites per camp are available for use in this subbasin; twenty-two of these areas possess water-dependent activities which enhance the camping experience. Group camps, such as those of Boy Scouts of America, number nine, all of which have water-dependent activities. The total capacity of these camps is 893 persons.

Oswego Subbasin. The Finger Lakes provide an unexcelled resource base for 130 public and private recreation establishments in the Oswego Subbasin. The Finger Lakes have been the destination of vacationists for many years, and considerable recreational activity takes place around and on these lakes each summer. Recreation in general is a major influence in the economy of the subbasin in that expenditures in connection with recreation by vacationists, tourists, and sportsmen constitute the principal source of revenue for a number of towns and communities (67).

Nearly 121,000 acres of land and water have been preserved and developed for public recreation purposes. These include 101,506 acres in 33 state areas; 6,164 acres in 14 county parks; and a Federally-owned land use area totaling 13,267 acres. The recreation acreage in public ownership compared with the total area of the subbasin is less than 4 percent. When the population of the subbasin (872,000 in 1960) is considered in relation to the total public recreation acreage, there are about 139 acres of recreation land for each 1,000 residents. However, only 15 of these 139 acres have been developed.

The 15 state parks in the subbasin are listed in Appendix C along with their acreage, facilities, and visitor attendance for 1965. In general, the parks are well developed and maintained, offering a variety of facilities for day, weekend, and vacation use. Annual visitation to the subbasin's state parks was nearly 2 1/4 million in 1965, representing a 63 percent increase since 1950. Green Lakes, a 925-acre state park situated on the eastern outskirts of the Syracuse Metropolitan Area, had the highest 1965 visitation figure (508,368) of the state parks in Zone 2.

The other 18 state areas consist primarily of undeveloped lands and waters administered as game management areas, state reforestation areas, multiple use areas, and boat launching sites. In terms of acreage, these underdeveloped and undeveloped areas constitute 92 percent of the state recreation lands for the subbasin.

Hector Land Use Area, a 13,237-acre tract of land with many small streams and creeks, is the only Federal recreation area in this subbasin. The Forest Service manages the area under its multiple use policy. In 1965 an estimated 23,000 visits were made to this area which is developed for fishing and camping.

Onondaga County, which includes the city of Syracuse, has a well developed county park system. Its six developed parks cater primarily to day-use activities, although limited camping exists at two of the parks. Nearly 1.2 million visits were made to these areas in 1963. Four additional county parks with a total of 1,124 acres have been acquired but are presently undeveloped. In addition to the Onondaga County parks, four other subbasin county parks exist in Ontario, Cayuga, Oswego, and Madison Counties. Each of these parks primarily serves the day-use needs of the local citizens (100).

A variety of private establishments and accommodations for the tourist and vacationist exist in the Oswego Subbasin. Private summer homes and camps dot the shorelines of the Finger Lakes, while hotels, motels, cabins, cottages, tourist homes, and related establishments are distributed generally throughout the subbasin. Marinas and private yacht clubs are found along the lakeshores, and most of the hotels, motels, and tourist homes with lake frontage have bathing beaches for the use of their guests (67). Roseland Park at the northern end of Canandaigua Lake is the largest commercial amusement park in the Finger Lakes area. Many of the resort towns of the subbasin offer summer theaters, lake cruises, annual pageants, and celebrations. Of the 36 private campgrounds in the subbasin, 30 have facilities for water-dependent activities. These 36 areas total 2,318 acres of land with an average capacity of 48 sites per campground. Twenty-eight group camps, ranging in variety from 4-H club camps to those especially designed for use by handicapped children, average 47 acres per camp and have a combined capacity of 3,290 persons at any one time.

Black Subbasin. The 25 developed recreation areas of the Black Subbasin are used for a variety of activities including fishing, hunting, camping, mountain climbing, and winter sports. Most of the summer recreational use takes place in the vicinity of the Fulton Chain of Lakes within the Adirondack Park. Here, also, are nine campsites--five developed and four not--in Lewis, Herkimer, and Hamilton Counties. Old Forge, the principal resort town in the subbasin, is located in this area. Four boat launching sites, a game management area, and a state reforestation area comprise 85,287 acres or 98 percent of the zone's total recreation acreage. The remaining supply (2%) is allocated to the private sector, which includes seven private campgrounds and eight group camps yielding 1,603 acres for private use. These 15 private areas have a total one-time capacity of 1,408 persons. There are no Federal or local recreation areas in this subbasin. Also, this is the only zone of the basin without a state park.

St. Lawrence Subbasin. The green-thatched archipelago known as the Thousand Islands provides a focal point for aquatic sports at eleven scenic state parks. Besides these eleven parks, Robert Moses State Park near Massena accounts for the twelve state parks of this subbasin. In 1965 Robert Moses State Park with approximately 185,000 visitors received the highest attendance of all public recreation areas in the subbasin. Aside from the picturesque state parks of the St. Lawrence Subbasin there are twelve public campsites and seven public boat launching sites located on inland streams, rivers, and lakes. Even though state lands of Zone 3 (Black Subbasin) exceed those of Zone 4 (St. Lawrence Subbasin) by threefold, the latter attracted eleven times more visitors in 1965.

Cranberry Lake, Tupper Lake, Harrisville, Long Lake, and Alexandria Bay are major resort centers where private and commercial recreation developments prosper (65). Fifteen private campgrounds with an average capacity of 44 sites have been developed on 2,123 acres of land. Also, five private group camps and a vacation farm contribute to the recreation resource base of this subbasin. Most of the estimated 2,242 private vacation homes of the subbasin are situated on the many islands and along the banks of the St. Lawrence River, as well as on privately owned lands within the Adirondack Park. Individual owners often rent their vacation homes to others during portions of the summer season.

Small Streams Tributary Subbasin. Lake Ontario, with its sand beaches, bluffs, marshy inlets, and bays, is the outstanding natural attraction of this subbasin. The lake is within easy driving distance of the urban centers of northern and western New York, and its shoreline recreation facilities are popular throughout the summer recreation season as is evidenced by attendance at the subbasin's 17 state parks. The entire 1965 attendance for these parks exceeded 1.6 million, second only to Zone 2 (Oswego Subbasin) in total visits to state parks. Five state parks--Ft. Niagara, Hamlin Beach, Fair Haven Beach, Selkirk Shores, and Westcott Beach--contributed 75 percent of the subbasin's state park attendance. Of the 27 state recreation areas in the subbasin, 22 support water-dependent activities. Only three remain undeveloped.

In 1963 the six developed Monroe County Parks in this subbasin: (a) contained 3,700 acres of land and water, (b) supported water-dependent recreation activities, and (c) accommodated approximately 4.5 million visitors. Other county parks in this subbasin are in Niagara, Wayne, Oswego, and Jefferson Counties.

A wide range of private and commercial recreation facilities exist along Lake Ontario's shoreline. Motels and tourist homes are numerous in towns along the lakeshore and on principal traveled routes. Some of the towns, such as Sodus Point, Olcott, and Fair Haven, have developed into summer resorts with nearly their entire economy based upon recreation. There are 25 private campgrounds, 10 group camps, and 3 vacation farms in Zone 5. All of these private areas, which can accommodate an estimated 3,500 recreationists at any one time, support water-dependent sports. See Plate No. 4-6.

WATER-DEPENDENT ACTIVITIES

Water is available for recreation in all the subbasins. The major cities (over 10,000 population) of the basin are located on Lake Ontario, inland lakes, rivers, or the Barge Canal. Thus, the basin's water resources are generally well distributed with respect to centers of population.

It will require effort, time, and money to solve the serious problems that limit the supply of water for recreation. These problems can be grouped into three general categories: (a) water quality, (b) conflicting uses, and (c) accessibility.

Water quality is as important as the amount of surface acres, miles of shoreline, or location. This particular aspect of water recreation is presented in Chapter 6.

Plate No. 4-6

Water polo at Kenan YMCA Camp. Lake Ontario is one hundred yards north of this pool. (Photo courtesy Lockport YMCA, Inc.)

The demand for water for many other purposes--water supply, industry, irrigation, power generation, flood control, and navigation--is rising. Only with the most careful planning and full recognition of the values of each use will it be possible to achieve an adequate supply of water for recreation. This function is entrusted to the New York State Water Resources Commission which is currently preparing a statewide comprehensive water resources development program.

While the basin's inland waters are publicly owned, the adjacent land frequently is not. This fact creates problems of public access which must be solved before much of the total supply of water can be considered as a part of the effective supply of recreation resources. Further discussion of this point is taken up in Chapter 5.

To a lesser degree, other factors affecting the physical use of water-based recreation areas are weather conditions, lake fluctuation, transportation, and admission and/or user fees. Climatic influences upon the recreation use of the basin are analyzed in Chapter 2. Lake fluctuation or unregulated water levels are periodically responsible for lakeshore property damage. Extremely high water levels would preclude the use of beaches as well as cause extensive damage to lakefront facilities such as cottages, piers, boat houses, and lifts. Conversely, low water levels create shallow water problems requiring the dredging of harbors and marinas before watercraft can be used.

For many people residing in the central city of the basin's SMSA's transportation to water-dependent recreational developments in a nonurban environment is difficult. These people usually rely upon public travel accommodations since many of them, for economic reasons, do not own automobiles. State Park admission and user fees could also be a financial problem for large families in low income classes.

Swimming. Swimming and sun bathing are enjoyed throughout the Lake Ontario Basin in both natural and developed areas. Within the basin 46 areas offer the opportunity for swimming at public beaches. Thirteen of these are located on the Lake Ontario shore and ten along the St. Lawrence River. Developed beaches along Lake Ontario and inland lakes are heavily used during the summer season (Plate No. 4-7). Estimates show that the basin's public beaches provide about 4.6 million activity occasions of swimming annually.

ORRRC Report No. 4 indicates that there are 35 miles of natural sand beach on Lake Ontario. It is estimated these beaches have a potential annual capacity of 18.5 million activity occasions of swimming per year. The physical character of beaches and other swimming areas varies greatly throughout the basin. Some are extensive areas of high quality sand, such as the eastern Lake Ontario shoreline, while others are narrow gravel or small rock beaches similar to those along the lake in Niagara and Orleans Counties.

An analysis of 1964 attendance data for Hamlin Beach State Park (81) indicates that the number of persons swimming correlates closely to the weather. The table on page 4-16 summarizes this data and reveals that swimming participation increases as the temperature rises. Also, it is noted that 52 percent of this state park's patrons participated in swimming.

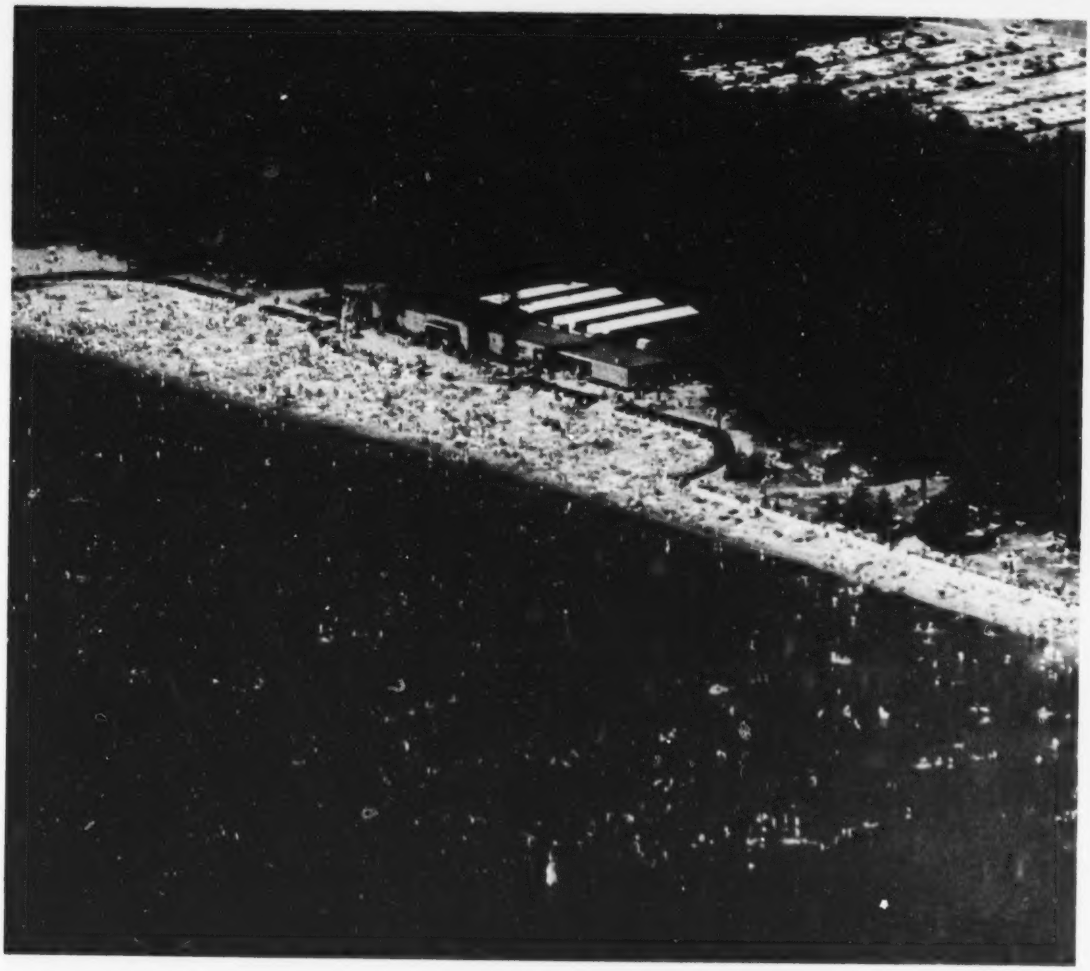


Plate No. 4-7 *An aerial view of the bathing facilities at Verona Beach State Park on a typical summer Sunday. (Photo courtesy Central New York State Parks Commission)*

A review of statistical data for Verona Beach State Park (80) disclosed that approximately 60 percent of the 1964 total park attendance used the beach facility on Oneida Lake. In 1965 the Thousand Islands State Park Commission distributed a questionnaire to campers in all their parks. Results of the survey revealed that 75 percent of the campers would not stay in the Commission's parks unless swimming facilities were provided (83).

Table No. 4-1

COMPARISON OF SWIMMING PARTICIPATION TO TOTAL GATE ATTENDANCE BY GENERAL WEATHER CONDITION AT HAMLIN BEACH STATE PARK, LAKE ONTARIO BASIN (June-August 1964)

General Weather Condition		Attendance		
Average Daily Temperature Class	No. of Days	Persons Swimming	Total Park	Percent Swimming
Cool-mild (less than 80° F)	43	23,537	59,821	39
Warm (80°-89° F)	35	50,979	93,473	54
Hot (more than 90°F)	14	35,787	59,630	60
Totals	92	110,303	212,924	52

Source: 81

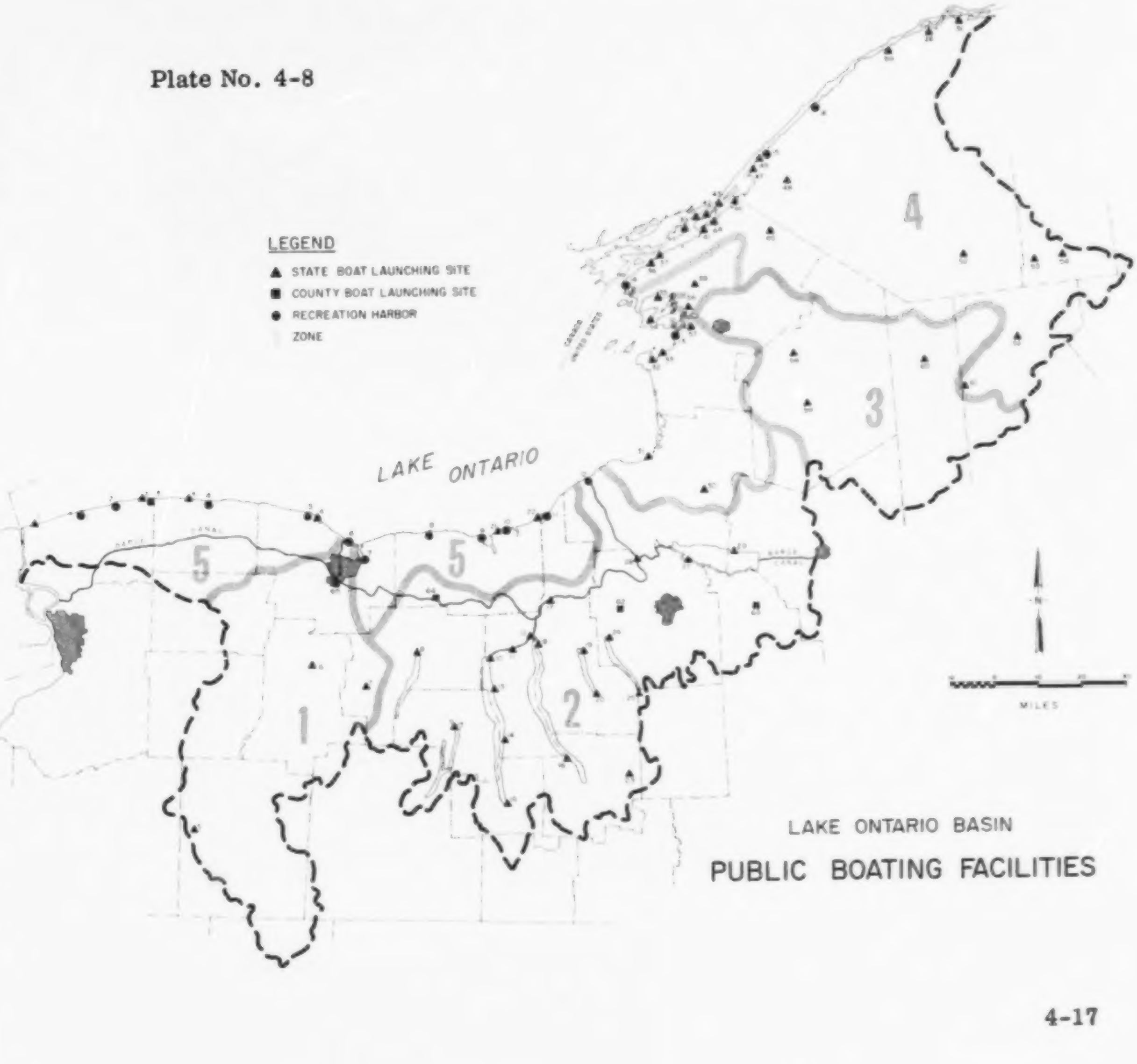
Note: Rain was reported on 13 separate days during the period, June-August, 1964. On these 13 occasions about 41 percent of the total gate attendance used this public Lake Ontario shoreline beach. Temperature departure from the normal mean for June, July, and August was -1.1, 2.2, and -3.5 degrees, respectively (156). Thus, the 1964 summer in the vicinity of Hamlin Beach was about 2.4 degrees below the expected seasonal average.

Besides the 46 aforementioned public beaches, there are public swimming pools at 6 state parks and 2 county parks. These combined facilities provided an estimated two million annual activity days of swimming in 1965. Unlike natural beaches, swimming pools are not subject to erosion, sedimentation, and adverse effects of storms. However, most swimming pools are unable to offer such amenities as sun bathing, playing in the sand, and exploring the shoreline, amenities which normally are available at a beach. A comparison of the relative cost of providing a unit of swimming activity at a natural beach area as opposed to providing a unit of swimming at a pool was made in the Lake Erie report. On the average, construction costs are eighty dollars more per unit of daily swimming capacity at a pool than at a natural beach (184).

Beach erosion is a significant problem at some of the natural areas along the Lake Ontario shore. The U.S. Army, Corps of Engineers, completed a series of beach erosion control studies in 1955 for Hamlin Beach State Park, Fair Haven Beach State Park, and Selkirk Shores State Park. The beaches at these parks are scheduled for rehabilitation by dredging and construction of groins to prevent future erosion and inundation. The project at Selkirk Shores State Park is about 49 percent complete, but no completion date has been established. Work has yet to be initiated on the projects at Fair Haven Beach and Hamlin Beach State Parks; however, advance planning for the Hamlin Beach project will start in 1967.

Boating. The Lake Ontario Basin offers the recreational boater a variety of water resources unexcelled in any of the other Great Lakes Basins. As shown on Plate No. 4-8, the key centers of boating activity are along Lake Ontario, the St. Lawrence River, and the Finger Lakes. A listing of these areas and sites appears in Appendix A, Table No. A-6. Approximately 3,100 recreational watercraft can be

Plate No. 4-8


LEGEND
▲ STATE BOAT LAUNCHING SITE
■ COUNTY BOAT LAUNCHING SITE
● RECREATION HARBOR
ZONE
LAKE ONTARIO
CANADA
UNITED STATES
BARGE CANAL
1
2
3
4
5
5
MILES

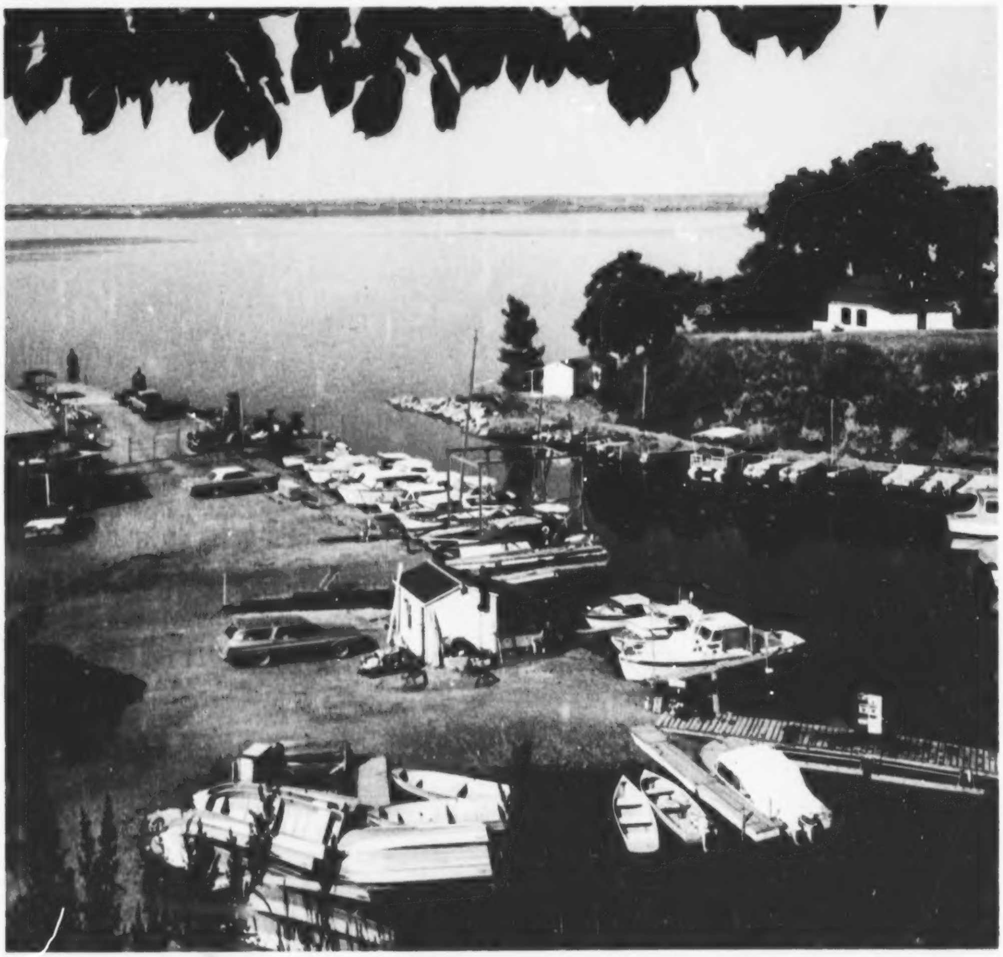
LAKE ONTARIO BASIN

PUBLIC BOATING FACILITIES

accommodated at nine U.S. Army, Corps of Engineers designed and constructed recreational harbors along the lake shoreline. In addition, public boat launching facilities exist at 65 state-owned locations throughout the basin. Most of the basin's private marinas and attendant facilities are situated in the Finger Lakes area and along the St. Lawrence River (Plate No. 4-9).

The New York State Barge Canal--commonly known as the "Grand Canal"-- and its connecting waterways afford boating enthusiasts a safe, scenic route to many natural and historic sites. The Division of Motor Boats in the New York State Conservation Department has prepared a two volume cruising guide for the Canal.

Plate No. 4-9



Marina facilities at Dresden on Seneca Lake providing basic services for recreational boating. (Photo courtesy New York Department of Commerce, Travel Bureau)

Plate No. 4-10

The houseboat affords the vacationing family an opportunity to see the basin's natural scenic features via water. (Photo courtesy Fingerlakes Houseboat Vacations)

Also, the Department of Public Works, Division of Operation and Maintenance distributes free pamphlets regarding pleasure boating on the inland waterway. Boating on the Barge Canal has increased tremendously in popularity in the last ten years, as illustrated by the fact that twice the number of pleasure watercraft use the Barge Canal now as compared to 1956 (94).

Vacationing by houseboat has grown rapidly in the past five years. This mode of boating allows the vacationing family to extensively traverse the basin's scenic water routes and to experience a close relationship with the natural features of the basin. Private houseboat rental agencies are centered in the Finger Lakes area and in the Thousand Islands area. The Barge Canal and Lake Ontario provide connecting routes of travel between these two recreation resource areas (Plate No. 4-10).

Spectators at the Annual Seneca Falls Aqua Festival. (Photo courtesy Finger Lakes Association, Inc.)

Plate No. 4-11

Other activities associated with boating, such as water-skiing, sightseeing, scuba diving, and bow fishing, are frequently engaged in throughout the basin. Boating is also an important spectator sport, drawing large numbers of people at events such as the Seneca Falls Aqua Festival and the Intercollegiate Rowing Regatta (Plate No. 4-11).

Fishing. Next to swimming, fishing is the most popular form of water-dependent activity. This report will not attempt an evaluation of fishing activity, either sport or commercial, since reports being prepared by the Bureau of Sport Fisheries and Wildlife and the Bureau of Commercial Fisheries will cover this topic. However, mention will be made of water access sites since these areas are used for activities other than fishing. As previously indicated on Plate No. 4-8 and in Table No. A-6, public access is provided at 65 state-owned boat launching sites. Access is also possible at public waterfront facilities such as piers, seawalls, and breakwaters along Lake Ontario. Private water for fishing is largely centered around the small farm pond. Over 7,900 farm ponds, averaging one-half acre in size, are scattered throughout the basin. Table No. A-7 in Appendix A shows the approximate number and size of farm ponds by county. See Plate No. 4-12.

Water-skiing. Water-skiing is one of the fastest growing water-dependent outdoor recreation activities, and it is especially popular with the young adult age group. Water-skiers are likely to be found on any body of water large enough to permit maneuvering of boats and skiers. The greatest concentration of water-skiing in the basin occurs on the Finger Lakes; however, water-skiers also utilize Lake Ontario and the St. Lawrence River but to a lesser degree.

Canoeing. Historically, the canoe was designed and was used by the North American Indian as a means of transportation throughout the vast network of inland waters in the Great Lakes Basin. The Indians brought the canoe to a high stage of development when they constructed a craft so light that it could be carried by one man and yet so strong and buoyant that it could transport a considerable load. Over the years the canoe was perfected by the white man. Today, most commercial canoes are manufactured of aluminum or fiberglass.

Canoeing is a special type of boating activity that is limited only by the skill and imagination of the participant. Although canoeing is pursued predominantly by the adolescent and young adult age groups, even a sexagenarian might be an active canoeist. The primary factors that make this activity an unusual and attractive sport have been stated by Burmeister (11):

> Canoeing provides esthetic satisfaction through intimacy with nature. . . physical satisfaction through boating techniques that permit the enthusiast to challenge one of nature's forces. . . mental satisfaction through meeting the challenge and by exercising a normal degree of aggression without being subjected to the criticism of civilized society. . .

This Ontario County farm pond offers opportunities for fishing and other recreation activities. (Photo courtesy Soil Conservation Service--No. NY-1032-6)

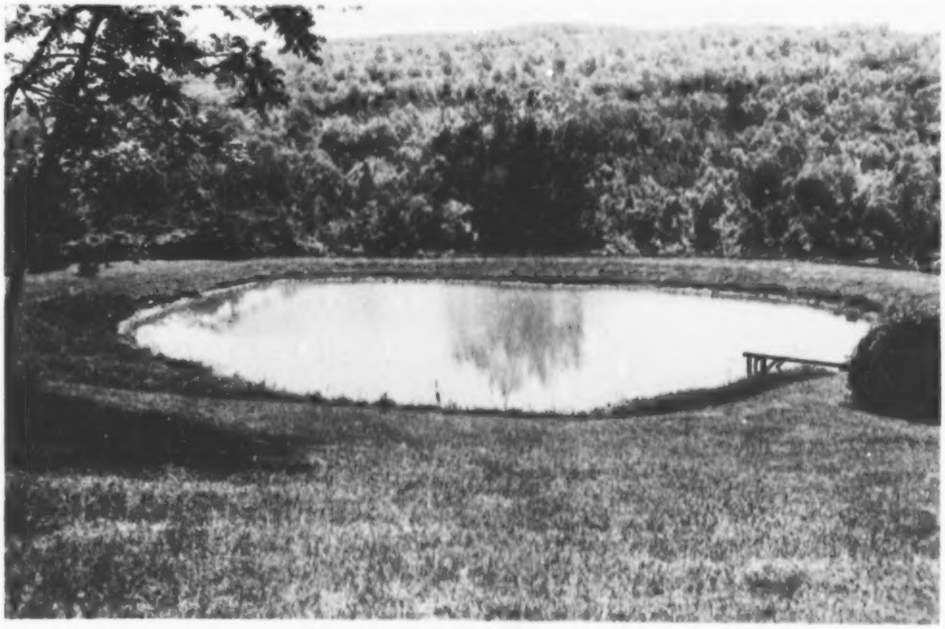


Plate No. 4-12

Nearly 1,000 miles of designated canoe routes exist in the Lake Ontario Basin (Table A-8, Appendix A). Plate No. 4-13 illustrates that most of these routes or trails are located in the northeastern section of the basin. The most popular Adirondack canoe trail extends from Old Forge in Herkimer County, at the foot of the Fulton Chain of Lakes, through various lakes and the upper reaches of the Raquette River to Tupper Lake (41). In addition to the trails on Plate No. 4-13, many miles of water travel are available in the basin for canoeing such as the Barge Canal, the Finger Lakes, and Lake Ontario; however, these bodies of water generally fail to provide either the esthetic or physical characteristics necessary to create an enjoyable canoeing outing.

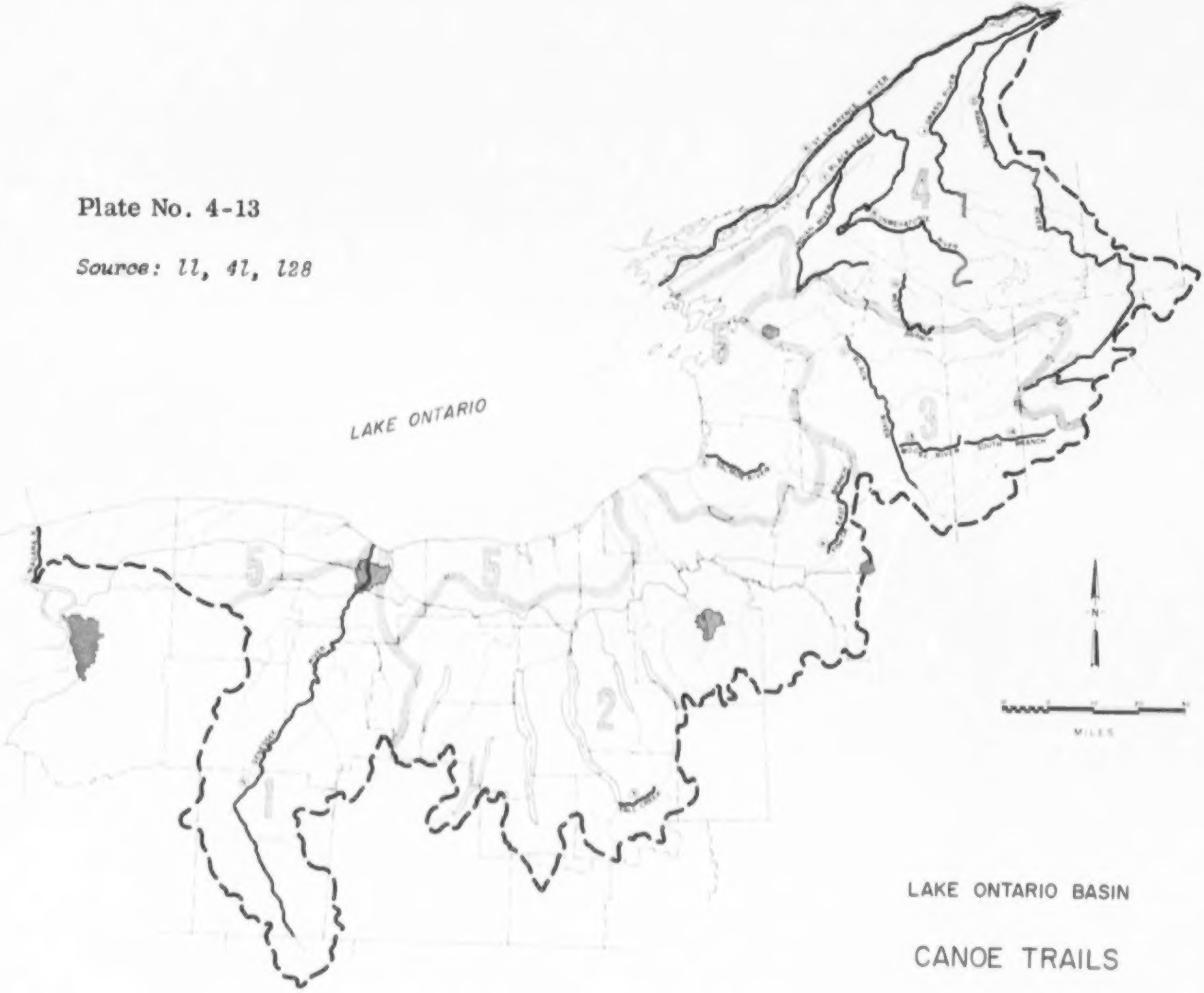


Plate No. 4-13

Source: 11, 41, 128

LAKE ONTARIO BASIN

CANOE TRAILS

Plate No. 4-14

Sailboats ply the waters at Skaneateles Lake. After a trip around the world, William H. Seward, Secretary of State under President Lincoln, called Skaneateles Lake "the most beautiful body of water in the world." (27) (Photo courtesy Syracuse Herald-Journal)

Sailing. Sailing is a particularly popular activity on the Finger Lakes (Plate No. 4-14). Lake Ontario and sections of the St. Lawrence Riverway are also used extensively for sailing. Most of the yacht clubs in the Finger Lakes area hold sailboat races periodically.

WATER-ENHANCED ACTIVITIES

Most recreational activities are more enjoyable in beautiful, natural surroundings. The following activities could be pursued virtually anywhere; however, their popularity is definitely enhanced by the presence of water.

Picnicking. "Outdoor Recreation for America" stated that picnicking is the most preferred activity for a day's outing. Perhaps it is popular because it involves little expense other than travel costs and requires a minimum of equipment and ability. Also, participation is not limited to any age group. This family outdoor activity is provided at 70 percent of the developed public recreation areas of the basin. Since picnicking is principally a day-use activity, those public parks located near the basin's population centers supply the majority of picnic use. Two recreation areas experiencing heavy picnic use are Ellison Park of the Monroe County Park System and Green Lakes State Park located in the Syracuse SMSA. Appendix C indicates those areas providing public picnicking facilities in the Lake Ontario Basin.

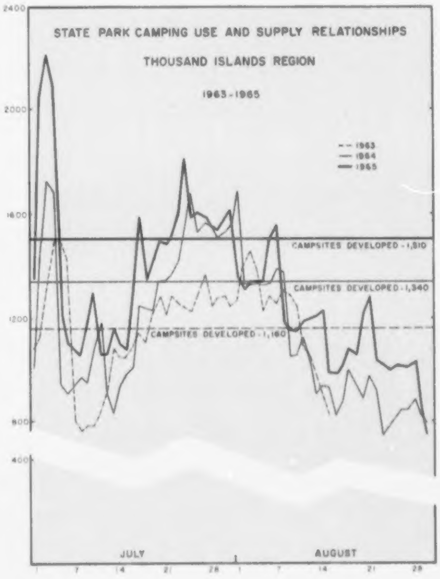
Camping. Nationally, camping is growing by leaps and bounds, and the popularity of this activity is increasing rapidly every year in the basin as well. This growth can be attributed to (a) the desire of Americans to travel as fast, as far, and as cheaply as possible for vacations and weekend outings, (b) innovations in camping gear and equipment and in the automotive industry, and (c) well-developed campgrounds.

Plate No. 4-15 illustrates the relationship between the use and supply of tent and trailer campsites at 15 public state parks in the Thousand Islands region. From this graphical illustration, it may be concluded that: (1) during all three seasons the instant camping capacity was exceeded at least one-third of the time; (2) with the exception of July 4th holiday outings, the peak use period is from July 20 to August 9; and (3) the development of 180 additional campsites in 1964 and 170 campsites in 1965 has kept pace with the growth of camping.*

Over 40 percent of the developed state recreation areas listed in Appendix C have tent and/or trailer camping facilities available while less than one-seventh of the local public recreation areas inventoried provided camping facilities. At the private level 111 campgrounds with an average size of 98 acres per campground have a total capacity of 6,482 tent and/or trailer sites (Table No. A-4, Appendix A).

Sightseeing. Sightseeing is an extremely popular activity within the basin. The many highways and roads throughout the basin afford opportunity for participation. Forty-five roadside rest areas are located in the project area with the Oswego Subbasin containing nearly half the total. The Lake Ontario State Parkway is intensively used for sightseeing, particularly on weekends. By 1970 this 20-mile parkway is to be extended along the lakeshore from its present western terminal point at Hamlin Beach State Park to Lakeside Beach State Park in Orleans County. Future plans call for the further extension of this parkway to Fort Niagara State Park at the northwestern tip of Niagara County linking it with the proposed Robert Moses State Parkway which will originate at the North Grand Island Bridge. Since commercial traffic will be banned, driving for pleasure as well as sightseeing will be an enjoyable experience

Plate No. 4-15



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* During the 1966 summer, personnel at Letchworth State Park conducted a camping survey. An analysis of the data indicates that 40 percent of the camper days spent by recreationists at that park originated from outside the state.

along this scenic route permitting uninterrupted scenic travel from the heart of the Buffalo SMSA to the northern city limits of Rochester.

Nature Walks. Nature walking is greatly enhanced by the presence of specific facilities such as trails and guided or self-guided tours. Since nature walking is chiefly an esthetic experience, the accent must be placed upon quality. Nine state parks within the basin provide nature trails for participation by all age groups. The metropolitan county park systems in Monroe and Onondaga Counties have several miles of nature trails.

Hiking. Designated hiking trails exist at 17 of the 47 developed state parks in the basin. Hiking trails are also provided at three recreation areas by the Onondaga County park system, and in Monroe County two county parks have designated hiking trails. In addition to these public facilities, many miles of hiking territory are available for exploration on state reforestation areas, game management areas, and multiple use areas. Several quasi-public organizations such as Boy Scouts, Girl Scouts, 4-H, etc., have provided their own system of hiking trails at their respective group camps. The Finger Lakes Trail Conference, a group of private hiking clubs in central New York State, are planning and constructing a continuous trail system across the southern portion of the Lake Ontario Basin. When completed, the 650-mile system will connect with the 2,000-mile Appalachian Trail and the 250-mile Bruce Trail of Canada (28).

Hunting. Public hunting in the Lake Ontario Basin is generally confined to the state's game management areas, state reforestation areas, wetlands, and multiple use areas. Limited hunting is provided on state park lands. For example, deer hunting is permitted in selected areas of Letchworth State Park when the deer population becomes excessive, and duck hunting is allowable at Braddock Bay State Park near Rochester. In both instances, hunting is limited by the number of special permits issued and by the size of the hunting area. Private hunting clubs rent sizable acreages of rural land from farmers for exclusive hunting privileges. As previously stated in Chapter 1, this report will not evaluate the basin's hunting facilities since the Bureau of Sport Fisheries and Wildlife will investigate this activity and report its findings.

WINTER SPORTS

Ever since skiing became a popular sport in this country, New York State has been a leading winter sports area (74). Some of the state's best skiing facilities are located in the basin. Reference is again made to Plate No. 3-2 where public ski centers are shown in relation to mean annual snowfall. Table No. A-9 in Appendix A lists 47 slopes, 59 trails, 28 lifts, and 22 tows which are available for skiing at 17 different locations in the basin. In 1965 the Travel Bureau of the New York State Department of Commerce completed a "Survey of Skiers' Preferences" for the 1964-65 ski season. This study concluded that the typical skier:

- Has skied for four seasons.
- Considers himself an intermediate
- Is a member of a family in which two adults ski
- Prefers moderate slopes, a chair lift, and moderate moguls for his day on the slopes
- Owns his ski equipment--boots, skis, and poles
- Has taken some ski lessons
- Usually patronizes a ski center's restaurant facilities, more often for only a snack than for a meal
- Stays overnight half of the time and prefers a motel or a hotel
- Considers social activities important in selecting a ski center
- Will pay up to $6.00 for an all-day lift ticket
- Will pay up to $60.00 for a season ticket
- Considers the overall cost of skiing too high (75).

A variety of other winter sports such as ice skating, ice fishing, sledding, tobogganing, and ice boat sailing and racing are pursued and enjoyed where facilities are available and when favorable weather conditions prevail (Plate No. 4-16). Perhaps one of the most unusual winter recreational activities is harness racing on the ice. The following excerpt is from a picture story which appeared in the January 28, 1963, issue of the Syracuse Herald-Journal:

> The antique sport of harness racing on the ice was revived on frozen Cazenovia Lake yesterday. An estimated 3,700 spectators watched the 16-horse, three event program. The social-sports afternoon was presented by the Central New York Trotting and Pacing Club for benefit of the Cazenovia College Auxiliary (139).

Winter Sports Scenes

Ice boating on Honeoye Lake

T-bar lift in operation at Swain Ski Center

Motorcycle races on the ice at the annual Honeoye Winter Carnival

Plate No. 4-16 *All photos courtesy Finger Lakes Association, Inc.*

PROPOSED AND POTENTIAL RECREATION AREAS

For the past six years, the State of New York has participated in an accelerated land acquisition program financed by a $100 million bond issue. Under this program the State has acquired more than 35,500 acres of state park land; has secured 283,000 acres of multiple use and forest recreation areas; and has assisted cities, counties, towns, and villages in acquiring 31,000 acres of land (205). Nearly 30 percent of the newly acquired state park lands and approximately 40 percent of those lands acquired as multiple use areas and state reforestation areas are in the basin. The needs and goals for developing these proposed areas are presented in the following chapter.

Specific areas offering recreational potential along the shoreline of Lake Ontario and along the St. Lawrence River were identified by the National Park Service in a survey conducted in 1958 (192,194). The report identified eight areas of potential recreational value in the area under study here. The following outline presents the name and action taken by New York to acquire the recommended area.

Name	County	Acreage	Action
Niagara Extension	Niagara	648	State has acquired 248 acres which is Four Mile Creek Annex State Park.
Parkway Overlooks	Orleans	821	Proposed Lake Ontario Parkway Extension, including three overlooks, has been completed to Kuckville.
Devils Nose	Monroe	190	State has acquired this tract as part of the Lake Ontario Parkway.
Chimney Bluff	Wayne	150	State has acquired 596 acres and development has started at Chimney Bluffs State Park.
Fairhaven Extension	Cayuga	386	State has purchased 44 acres of this suggested area.
Sandy Creek Beaches	Oswego-Jefferson	2,969	A new state park, Southwick Beach, is being developed. Also, sizable fish and game management lands have been acquired near Woodville.
Stony Point	Jefferson	1,600	No State action.
Crooked Creek	Jefferson-St. Lawrence	4,425	No State action.

As a result of the increased use of the New York State Barge Canal as a recreational waterway, the State Department of Public Works plans to provide better access to recreation facilities on the canal. At the local government level, the Monroe County Parks Department plans to acquire areas bordering the canal while the villages of Brockport and Fairport have designated potential lands for boating and general recreation facilities along the canal.

The U.S. Army, Corps of Engineers, is considering a system of harbors of refuge which would be situated at intervals of 10 to 15 miles along the Lake Ontario shoreline. The location of completed Corps harbor projects is shown on Plate No. 4-8. A few of the existing harbors illustrated on this plate have been improved or are being considered for improvement by the Corps. Four additional Corps harbor projects have been authorized but are presently inactive. Another 11 harbor projects* along the lakeshore are under study, authorized for study, or suggested for study (205). Most of these proposed facilities are part of the State's development program for state park lands. These harbors would provide needed boating opportunities for the basin's residents. Their construction is contingent upon receipt of Congressional approval and appropriations as well as state and local cooperation. Present legislation requires that local interests provide up to 50 percent of the cost of Corps constructed facilities for recreational boating.

In addition, the Corps of Engineers is currently involved in a multi-purpose study of the Genesee River Basin aimed at determining the advisability of modification to basin-wide plans with respect to flood control, navigation, and other related water and land resources (150). Although the plan formulation of this basin report will not be released until later this year, it appears that recreation will receive preferential treatment at a proposed reservoir on the Genesee River immediately upstream from Letchworth State Park.

Under the aegis of the International Joint Commission a study is underway to investigate the effects of water levels of the Great Lakes. This study will look into the possibilities of stabilizing the levels of all the lakes through regulation structures. Such stabilization should have a favorable effect on bathing beaches since extreme high and low water levels would be reduced.

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*Actually eight harbor proposals are along the lake shoreline and one each on the St. Lawrence River and on Seneca and Cayuga Lakes.

Two potential small watershed projects, authorized by Public Law 566, have been proposed by the Soil Conservation Service. Both projects have recreation featured as one of the primary benefits. Cowaselon Creek Watershed in Madison County will contain a 25-acre permanent lake which will be completed next year. When developed, this facility will provide for swimming, fishing, boating, and picnicking. The other project, Oak Orchard Watershed, will feature a 50-acre lake providing picnicking, boating, and fishing facilities. As soon as a water level and water distribution problem can be resolved between wildlife and agricultural interests, the Batavia Junior Chamber of Commerce has indicated its intent to actively support the proposed recreation development plan.

A comprehensive appraisal of potential outdoor recreation developments for Jefferson County was made in 1966 by the Soil Conservation Service (22). This report, "An Appraisal of Potential Outdoor Recreational Developments in Jefferson County, New York," considered such key elements as climate, physical resources (both land and water), wildlife, and population. In the analyzation of these factors, multipliers were employed to evaluate the probability or likelihood of recreation use for a potential activity for a given set of resource factors. In order to be more meaningful to those desiring to enter the private recreation service industry, the economics involved in developing, operating, and maintaining each type of recreational facility would add considerably to the evaluation scheme. Nevertheless, this report employs an interesting technique in assessing the recreational potential of various activities at the local level.

In 1963 the Federal Government initiated a broad-scale study for a nationwide system of wild rivers. Of the 650 rivers initially screened, nine are located in the Lake Ontario Basin. These are: the Black, Genesee, Grass, Indian, Moose, Oak Orchard Creek, Oswegatchie, Oswegatchie-West Branch, and Raquette (161). With the exception of the Genesee and Indian Rivers and Oak Orchard Creek, these rivers or portions thereof lie within the Adirondack Preserve boundaries. None of the nine rivers satisfied the initial screening criteria and were, therefore, excluded from a more intensive study for possible inclusion in the nationwide river system. However, all have the potential to be considered as state scenic, natural, or wild rivers.

Many potential recreation areas not presently included in recreation plans are available in the basin. The resource areas briefly discussed in Chapters 2 and 4 contain most of the more desirable sites. As recreational pressures increase, other recreation areas may be developed on lands presently considered to be of marginal recreation value. A good example is the Robert Moses State Park near Massena where a beautiful sand beach was created by placing hydraulic fill along a rocky shoreline area. Undoubtedly, all land will be more intensively developed in the future, and a detailed review may reveal areas that would provide additional recreation opportunity. Some areas may obtain recreational importance because of present unforeseen circumstances. For example, areas now held by the Department of Defense may be declared surplus and become available to state or local agencies for recreational development.

Chapter 5
Needs

GENERAL

The need for additional recreation facilities in the Lake Ontario Basin is manifested by unfilled requests for campsite reservations, by long lines of cars turned away at beaches, and by unsatisfied constituents voicing their complaints. Attendant to this increasing pressure for more facilities is the overuse of existing facilities. Overuse creates not only site deterioration, but also causes a lower quality recreation setting for future use.

Instances of unusually heavy use occur in the picnic areas at Durand Eastman Park in Monroe County. The heavy use and limited maintenance of this park's hiking and bridle trails has resulted in erosion along some sections of the trails (35). Chapter 4 revealed that the state park campgrounds in the Thousand Islands area for one-third of the summer season exceeded their capacity. These situations multiplied by similar circumstances substantiate the need for more developed park and recreation areas.

PRESENT NEEDS

In general, the needs of the Lake Ontario Basin are a part of the total State needs.* Since these needs are discussed in the New York Statewide Comprehensive Outdoor Recreation Plan (204), they will not be elaborated here. The purpose of this chapter is to evaluate the macrosituation of the basin's needs, both present and future, for outdoor recreation. Although the five subbasins exhibit varying degrees of needs, the translation of these needs into resource requirements is intended only to show relative comparisons. And the problem of translating the demand-supply-needs relationship into a quantitative evaluation limits its statistical application. The methodology used to analyze the basin's needs is presented in Appendix B.

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* With the exception of the 96 square mile section of the Genesee Subbasin which lies in Potter County, Pennsylvania.

The figures outlined in Table No. 5-1 show the need for developed recreational acreage in the basin. A large deficit of developed acreage exists in Zone 2. Zones 1 and 5 have sizeable acreage deficiency but not nearly so severe as Zone 2. Zones 3 and 4 indicate minor shortages of developed recreational lands.

Table No. 5-1

PRESENT REQUIREMENTS FOR DEVELOPED RECREATION ACREAGE
LAKE ONTARIO BASIN
(Nearest 100 Acres)

(1) Zone	(2) Total Needed	(3) Present Existing for Public Use*	(4) Deficit (Col. 2-Col. 3)	(5) Additional Deficit Acreage Needed (Col. 4 x 1.6)**
1	10,900	8,400	2,500	4,000
2	22,300	9,700	12,600	20,100
3	2,200	1,900	300	500
4	4,900	4,200	700	1,100
5	14,100	9,300	4,800	7,700
Basin	54,400	33,500	20,900	33,400

* See Table No. B-4, Appendix B.
**Determination of 1.6 factor is explained in Needs Methodology in Appendix B.

These acreages are the amounts considered necessary to support the maximum number of people expected to use recreational facilities at any one time on a normal summer Sunday. The acreages are based on categories of recreational areas suggested by Marion Clawson, et al., in Land for the Future. They are as follows:

(1) User-oriented areas, represented by city, county, and other local type parks, are usually located near the user irrespective of the quality of resources available. User-oriented areas may be compared to Class I--High Density Recreation Areas as defined by ORRRC in "Outdoor Recreation for America".

(2) Intermediate areas, represented by state and regional type parks, utilize the best available resources within a reasonable distance of the user. They may be compared to Class II--General Outdoor Recreation Areas as defined by ORRRC. To some extent, intermediate areas may also include the more highly developed Class III areas.

(3) Resource-oriented areas, represented by National Parks and Forests, are located in areas of outstanding resources. Since this category is based on location of resources and not necessarily on people's needs, it is not included in this presentation. The Adirondack Forest Preserve, an ORRRC Class V-B area, is representative of this category. Also, areas such as Taughannock Falls, the Finger Lakes, and the Thousand Islands could conceivably fall into this category except for certain factors such as intensive private development.

The acreage presented as "Deficit" indicates the additional acreage needed in each zone if divided equally between user-oriented and intermediate types of areas. This approach was necessary because the classification of existing areas into the two types is not clear-cut. An intermediate area may be user-oriented for a certain portion of the population, and both types can support essentially the same activities.

Besides the developed acreage necessary to support the five basic activities, other lands must be provided for the more extensive recreational uses such as hiking, hunting, sightseeing, and nature walks as well as providing desirable buffer areas. Additional lands have been considered in the methodology as they relate to the present deficit of developed acreage. The developed deficit (Column 4) plus the additional deficit acreage (Column 5) equals a total deficit of 54,300 acres for the basin. Depending upon the ability to provide these areas and considering use pressures, the deficit figures will be subject to modification. For example, if additional studies should show that user-oriented areas are needed in preference to intermediate ones, the figures could be lowered somewhat, or if intermediate areas required more attention, the figures could be raised.

On page 53 of the New York Statewide Comprehensive Outdoor Recreation Plan, it is stated that:

> The State's most pressing needs lie in the area of development. Although some deficiencies remain, primarily at the municipal level, acquisition under the $100 million bond issue has resulted in the accumulation of a substantial reservoir of recreation land resources for the State. During the next decade, development will demand a large part of the funds that may reasonably be expected from all possible sources, but further acquisition will be necessary.

This assessment of the needs situation holds true for the Lake Ontario Basin as well. In relating the regional needs presented in the New York State recreation plan (204) to the deficiencies shown in Table No. 5-1, the resource requirements outline for the basin was derived as follows:

Zone	Total Deficit Acreage*	Principal Facilities Needed
1	6,500	Boating, camping, swimming, picnicking
2	32,700	Boating, camping, swimming, picnicking, fishing
3	800	Boating, camping, fishing
4	1,800	Boating, camping
5	12,500	Boating, camping, swimming, picnicking

* Equals total of Columns 4 plus 5 in Table No. 5-1.

FUTURE NEEDS

Table No. 5-2 estimates future developed acreage requirements for each zone and for the Lake Ontario Basin. Future needs for the five activities (swimming, fishing, boating, picnicking, camping) considered in the preceding section will probably increase 120 percent by the year 2000, and by 2020 they may be expected to triple the presently needed acreage.

Table No. 5-2

FUTURE REQUIREMENTS FOR DEVELOPED RECREATION ACREAGE
LAKE ONTARIO BASIN*

(Nearest 100 Acres)

Zone	1960**	2020	2020
1	10,900	23,900	32,800
2	22,300	49,100	67,200
3	2,200	4,900	6,500
4	4,900	10,900	14,700
5	14,100	31,200	42,500
Basin	54,400	120,000	163,700

* See methodology in Appendix B.
** From Column 1 of Table No. 5-1.

These projections are predicted upon continued growth of the basin's population and economy and also upon the assumption that the recreational demands exerted upon the basin will be totally satisfied within the basin. While the demand methodology used makes certain allowances for nonresidents seeking recreation in the basin, their relative importance may change by 2000 and 2020.

Perhaps greater numbers of people will travel to the basin, increasing the demand on the basin's recreation resources. If its potential is fully realized, the private sector could help alleviate the future needs for public acreage. Flexibility will be needed as future trends become more clear.

Chapter 6
Water Quality Influences

GENERAL SITUATION

The most important factor affecting a water-dependent outdoor recreation experience is water quality. If the quality of the water is high, the opportunities for an enjoyable experience are enhanced. Conversely, low water quality can greatly reduce or eliminate a resource's capacity to provide recreation opportunity. According to Print No. 24 of the Select Committee on National Water Resources of the United States Senate (164), recreational uses of water require high quality water, paralleling that for public water supply. However, the limitations placed on recreation by water quality will vary depending on the type of water-oriented activity.

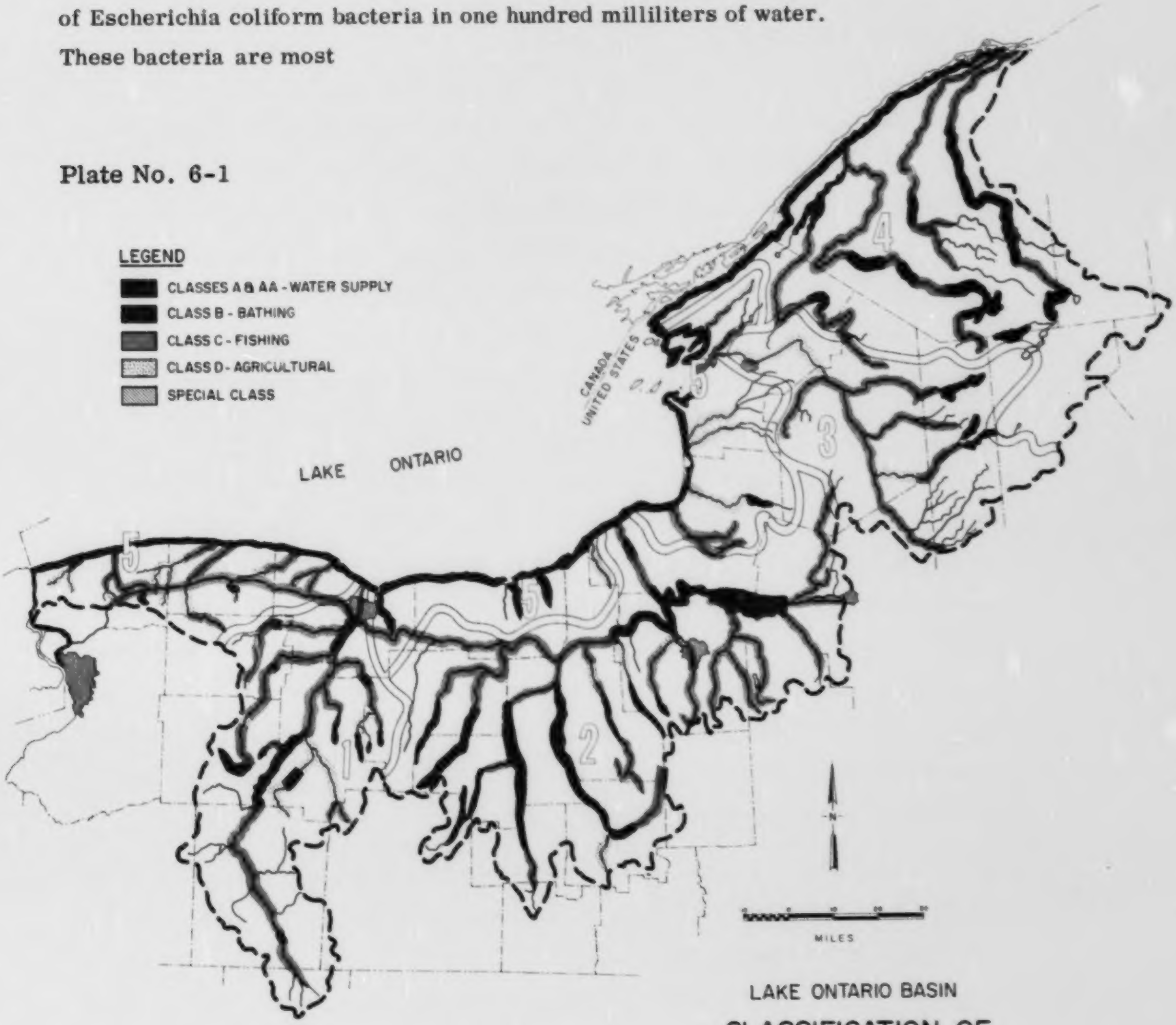
The most notable causes of pollution affecting recreational waters in the Lake Ontario Basin are poorly treated effluents from municipal sewage systems and industrial plants. Other significant sources of pollution are overflows from combined sewer systems, runoff from urban and rural areas, and wastes from commercial and private vessels (186). Recreationists often contribute to the pollution of recreation waters as well as the littering of adjacent land areas. As an example, waste discharges from pleasure craft, unsewered cottages, and other inhabited structures have resulted in low quality conditions at several public and private beaches and other recreation areas.

Water quality classifications and standards have been promulgated and adopted by the New York State Health Department for streams, lakes, rivers, reservoirs, and other bodies of water. The classification system for fresh surface waters ranges from Class AA to Class D with the highest use designated as water supply for drinking. This is followed by bathing, fishing, and agricultural or industrial, respectively. Both Class AA and Class A include public water supply use (85).

These best use classifications are graphically presented by stream reaches in Plate No. 6-1. The majority of the waters in the basin are classified B or C. However, most of the inland lakes, with the exception of Onondaga, are generally A or B. Dry weather streams and stretches of streams below sizable waste discharges are generally in Class D. The State Health Department anticipates that the special class presently designated for the lower Genesee River will be eliminated as a result of public hearings held this year in accordance with the Water Quality Act of 1965.

In this chapter reference is made to the term "coliform count," which is the number of Escherichia coliform bacteria in one hundred milliliters of water.
These bacteria are most

Plate No. 6-1


LEGEND
CLASSES A & AA - WATER SUPPLY
CLASS B - BATHING
CLASS C - FISHING
CLASS D - AGRICULTURAL
SPECIAL CLASS
LAKE ONTARIO
CANADA
UNITED STATES
1
2
3
4
5
5
N
MILES

LAKE ONTARIO BASIN
CLASSIFICATION OF
SURFACE WATERS

Source: 85, FWPCA, LOPO

frequently associated with human fecal matter, but they are also present in soil and animal feces. The rationale for using coliform counts to determine safe water conditions is based on a probability theory, viz., as the coliform count increases so does the presence of disease causing organisms. Many studies have proven the validity of this concept; however, there have been epidemiological occurrences in natural bodies of water with very low coliform counts (52). The real value of coliform counts lies in detecting changes in the quantitative bacterial composition of a body of water. Coliform count tests are used because (1) they are relatively easy to perform, (2) results can be obtained in a short time period, and (3) other practical systems have not been devised to determine the presence of pathogenic organisms in water. Even though there are some inadequacies in deciphering harmful bacteria from coliform counts, these tests do indicate the relative safety of water for recreational use.

WATER QUALITY INFLUENCES ON SWIMMING

To be acceptable to the public and to regulatory authorities, waters used for swimming and bathing must conform to three general conditions: (1) they must be esthetically enjoyable, i.e., free from obnoxious floating or suspended substances, objectionable color, and foul odors; (2) they must contain no substances that are toxic upon ingestion or irritating to the skin of human beings; and (3) they must be reasonably free from pathogenic organisms (52).

New York State water quality standards for Class B waters, which indicate the best use as bathing and other water contact sports, define the first two conditions in general terms, i.e., the standards are qualitative and descriptive and not quantitative, except for pH and dissolved oxygen. The third condition mentioned, viz., that swimming and bathing waters be reasonably free from pathogenic organisms, has been subjected to a strict and definitive bacterial standard. This standard, commonly known as Van Lare's Law, requires that the average of coliform counts for bathing beach waters must not exceed 2,400 per 100 milliliters (ml) of water over a 30-day period. The law does not specify the kind of average; however, the State Health Department has interpreted the law to mean a logarithmic average, which gives a lower value than an arithmetic average (133). Further, the Van Lare Law stipulates that not more than 20 percent of the counts may exceed 2,400 coliforms per 100 ml in a 30-day period.*

*On May 2, 1967, Governor Rockefeller signed into law an amendment to the Van Lare Law which made a median average the official coliform average.

Although Van Lare's Law is an accepted standard in New York, the technical committee on the Great Lakes-Illinois River Basins Project suggests that the coliform content of water used for bathing should not exceed 1,000 per 100 ml (185). The most restrictive standards are those of the states of Utah and Washington which limit the coliform content to 50 parts per 100 ml. Garber (34) has collated and evaluated bacterial standards for bathing water from several state and municipal agencies. He noted that coliform concentrations of acceptable bathing areas range from 50 to 3,000 bacteria per 100 ml.

Recently the water quality at beaches situated along Lake Ontario in the Rochester area received wide public attention through the news media. The following accounts provide an insight into the pollution problems at Rochester as well as other recreational areas in the basin.

Lake Ontario Shoreline -- Rochester Area. In September 1965 a Monroe County Grand Jury was appointed to investigate the circumstances, causes, and allegations surrounding the claims of polluted recreational areas in Monroe County. On April 5, 1966 the Grand Jury released its report which stated that the Lake Ontario beaches may be "unsightly, malodorous or otherwise undesirable, but they are safe for swimming from a health hazard point of view (138)."

The following month the Rochester Committee for Scientific Information, a private nonprofit citizen's group, issued a report warning of ". . . sporadic acute pollution of area beaches this summer. A survey, made between April 22 and May 11 (1966), disclosed human excrement, grease balls, shreds of toilet paper, and other jetsam off the Durand Eastman Park Beach near the city's sewage treatment plan (1)."

The report further stated that ". . . children should not be allowed under any circumstances to come in contact with (the Genesee) river water. Boaters should exercise great care to prevent the river water from contaminating food and drink."

During this controversy about the alleged polluted beaches in Monroe County, the Rochester Democrat and Chronicle published findings of a professional scientific survey group, the Harvey Research Organization, concerning water pollution and use of county beaches. Interviewers approached Monroe County residents to ask a representative cross-section of the adult population the question: "Last summer (1965) many health authorities warned about the dangers of water pollution and the health hazard it represented to swimmers. If water pollution in the Rochester area continues to be as serious as was reported last summer, would you be in favor of closing all beaches in this area in order to protect public health?"

Two-thirds of the people interviewed in the poll were in favor of closing all beaches for the 1966 summer season. Such action was favored particularly by those adults in the 25-40 age bracket who presumably have young children that enjoy swimming.

Nevertheless, the Monroe County beaches on Lake Ontario officially opened for the 1966 season on June 22nd despite pollution claims. During the summer, the Monroe County Health Department obtained daily water samples at public bathing beaches. Dr. Wendell R. Ames, Director of the Monroe County Health Department, released coliform bacterial counts to the news media on July 29, 1966.

The report, carried by the Rochester Democrat and Chronicle, said:

> . . . The average figures, showing coliform readings taken on an eight-day cycle between June 14 and July 7, indicated that at Webster Park, 31.2 percent of the counts exceeded the maximum allowable of 2,400 coliforms per 100 milliliters of water. The percentages at other beaches were, 12.5 at Durand Eastman, 16.6 at Ontario Beach; 10.7 at Hamlin Beach and no readings over 2,400 at Mendon Ponds Park.

The New York State Health Department began monitoring the three Lake Ontario public beach waters on July 18, 1966. Two weeks later coliform counts for these areas were released to the public. Under logarithmic computation, the State's two week averages for both Ontario and Durand Eastman Beaches were below the legal 2,400. However, the arithmetic averages for Ontario Beach and Durand Eastman Beach during the same period were 6,290 and 2,252, respectively. Webster Park Beach exceeded the limits by both methods of computation.

The Natural Resources and Power Subcommittee of the Committee on Government Operations of the United States House of Representatives held a public hearing concerning water pollution of Lake Ontario on July 22, 1966. At this hearing in Rochester, Mr. H. W. Poston, Regional Program Director of the Great Lakes Region, Federal Water Pollution Control Administration, presented a "Statement of Water Pollution in the Lake Ontario Basin" (186). Table 7-1 from the FWPCA statement is shown as Table No. 6-1 on the next page. In special beach studies conducted by FWPCA personnel during the 1965 and 1966 summers, it was found that Rochester area beaches experienced extremely high coliform counts.

Table No. 6-1

COLIFORM DENSITIES - 1965 AND 1966
ROCHESTER AREA BEACHES

Beach	Ontario		Durand Eastman		Webster	
Year	1965	1966	1965	1966	1965	1966
No. Samples	23	34	11	35	5	19
Coliform/100 ml highest	8,400	14,000	16,000	18,000	5,300	50,000
median	1,000	220	520	1,100	180	1,400
% above 1,000/100 ml	52	27	36	51	20	63
% above 2,000/100 ml	17	21	18	26	20	47

Source: 186

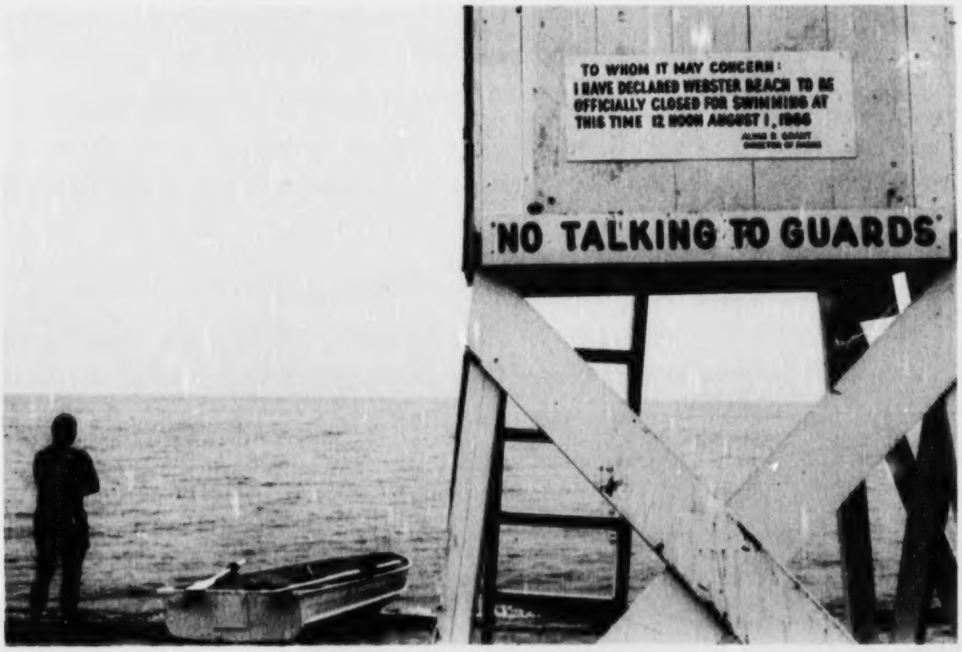
Amid all the publicity of pollution, people persisted in swimming and sunbathing at these public beaches. See Plate No. 6-2. This photograph, taken by a Rochester Times-Union staff photographer on July 24, 1966, appeared the following day in that newspaper. Mr. Alvan R. Grant, Director of Monroe County Parks, officially closed Webster Beach for swimming on August 1, 1966 (Plate No. 6-3). This decision was made for the following reasons: (a) the 30-day (July 1966) logarithmic average of coliform bacterial counts exceeded the 2,400 standard permitted by the Van Lare Law; (b) algae growth and water turbidity were excessive and would hamper lifeguards in rescue activities; and (c) wind and current patterns guided sewage from the Rochester sewage treatment plant outfall to Webster Beach. Plate No. 6-4 shows the direction of wind-current patterns and the location of the Rochester sewage outfall in respect to Webster Beach. The Rochester Democrat and Chronicle on August 2, 1966, quoted Mr. Grant as saying:

> Webster Beach will be closed for public swimming for the remainder of this season and perhaps for several more seasons until the city plant is upgraded. A lifeguard captain will remain on duty at Webster Beach to protect facilities. The beach itself may still be used for sunbathing.*

* Note: At the time this report was being prepared for the printer, Monroe County officials announced that Ontario and Durand Eastman Beaches will be closed for the 1967 summer. Although the City of Rochester has a commitment to New York State to install adequate primary treatment works at the plant by January 1, 1969, and adequate secondary treatment facilities by the end of 1970 (201), it may be five to seven years before conditions can be corrected. In the meantime, Hamlin Beach State Park, the only other Lake Ontario public beach in the Rochester metropolitan area, will probably be subjected to heavy swimming demand in light of this situation.

Plate No. 6-2

Seeking relief from heat, bathers show little concern for publicized pollution at Ontario Beach Park. (Photo courtesy Rochester Times-Union)



TO WHOM IT MAY CONCERN:
I HAVE DECLARED WEBSTER BEACH TO BE OFFICIALLY CLOSED FOR SWIMMING AT THIS TIME 12 NOON AUGUST 1, 1966
NO TALKING TO GUARDS

Plate No. 6-3

Photo courtesy Rochester Democrat and Chronicle.

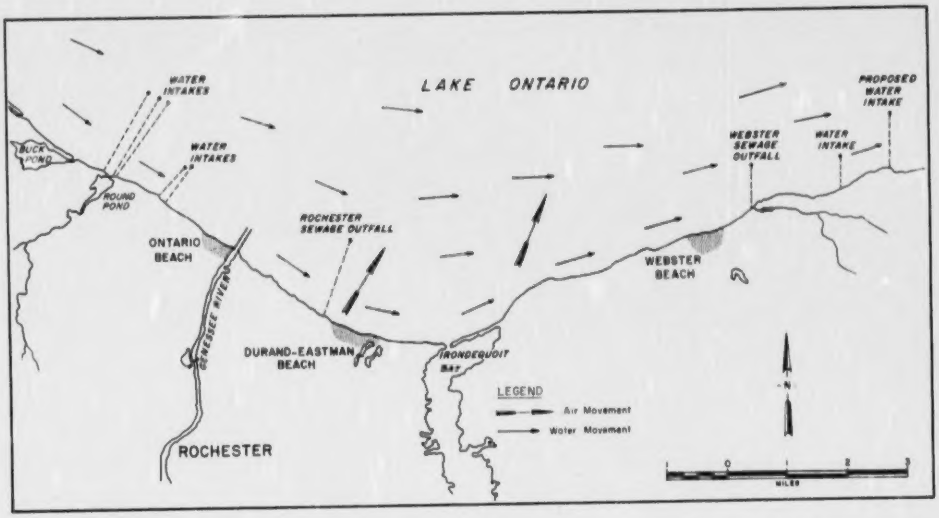

LAKE ONTARIO
WATER INTAKES
BUCK POND
ROUND POND
WATER INTAKES
ONTARIO BEACH
GENESEE RIVER
ROCHESTER SEWAGE OUTFALL
DURAND-EASTMAN BEACH
IRONDEQUOIT BAY
ROCHESTER
LEGEND
Air Movement
Water Movement
N
WEBSTER SEWAGE OUTFALL
WATER INTAKE
PROPOSED WATER INTAKE
WEBSTER BEACH
1 0 1 2 3
MILES

Plate No. 6-4

Source: 186

During the summer of 1966 as well as other recent seasons, the three Monroe County beaches--Webster Park, Ontario, and Durand Eastman--were sporadically plagued by the presence of decaying Cladophora, an attached form of green algae that grows on the rocky bottom of shallow offshore waters and washes ashore periodically. See Plate No. 6-5. On one particular day, Sunday, July 10, 1966, Webster Beach was so heavily laden with Cladophora that the lifeguards spent the entire day trying to clear the algae from the beach with pitchforks. According to an article appearing in the July 11, 1966 issue of the Rochester Democrat and Chronicle ". . .the stench (from the algae) was just incredible - you could not stand to be near the beach. The lifeguards did not have to worry about swimmers since no one dared to enter the water!"

Cayuga Lake -- City of Ithaca. Swimming conditions at Stewart Park on Cayuga Lake deteriorated appreciably during the early 1960's. On November 15, 1962, the Ithaca Youth Bureau Advisory Council* recommended to the City's Common Council that ". . .the Stewart Park waterfront be closed until such time as some action can be taken to alleviate the present conditions that exist, namely:

1. The problem of extremely high cost of operating a facility that is being used by a decreasing number of swimmers.

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*The Ithaca Youth Bureau administers the city's public swimming program at Stewart Park.

2. The problem of safety resulting from the difficulty of guarding a very large expanse of murky water.

3. The periodic problem of a high bacterial count, resulting from unusual circumstances such as dredging operations and sewage difficulties (44)."

The Common Council acted upon this recommendation, and the city's public swim program was moved for the 1963 season to the Ithaca Senior High School pool. Attendance for this season at the high school's indoor pool increased 52 percent over the preceding year's attendance. A final attempt was made to use the Stewart Park facility when the Ithaca Common Council agreed to move the public swim program back to the waterfront beach for the 1964 season. The 1964 results at the waterfront facility were disappointing:

(a) the average daily attendance was the lowest recorded in the previous seven seasons,

(b) coliform counts from water samples taken by county health officials often exceeded the Van Lare standard,

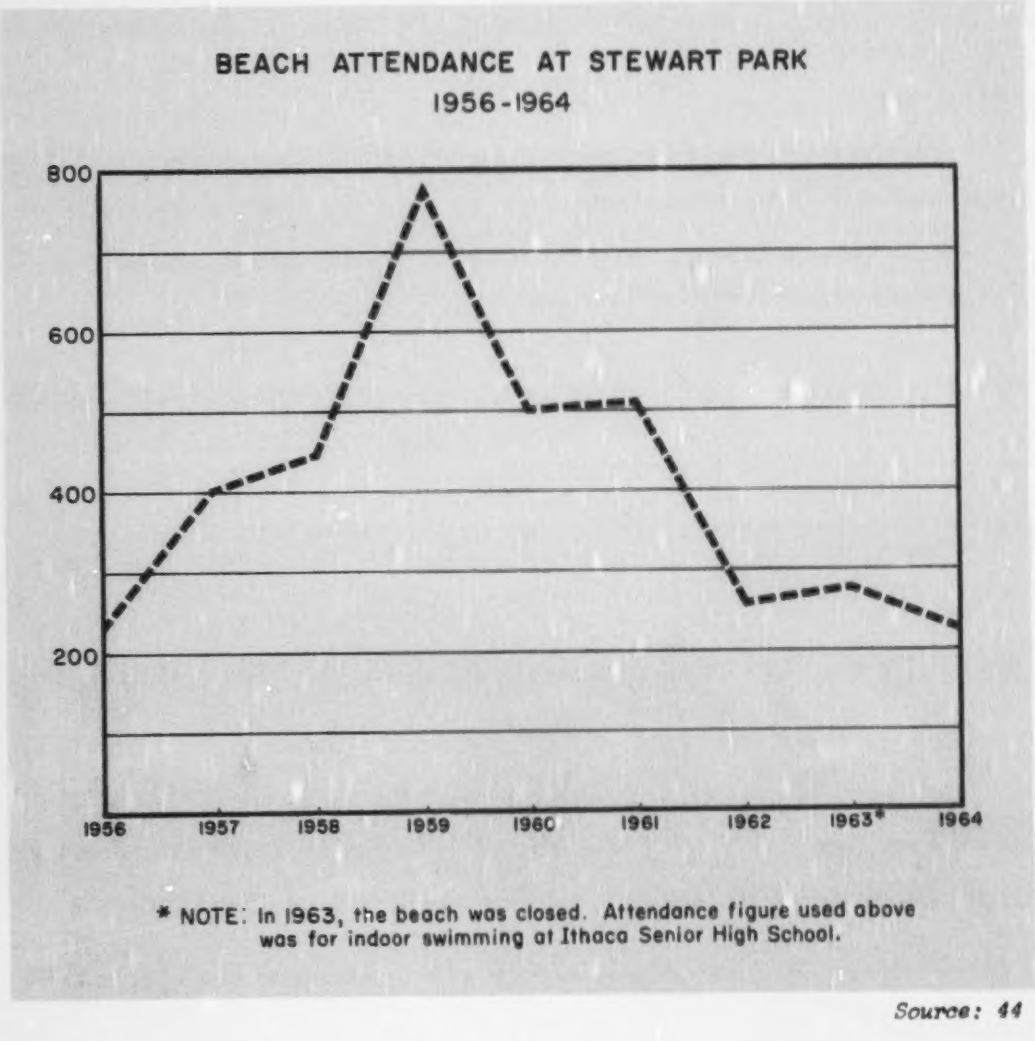
(c) water turbidity causing a safety hazard with respect to rescue operations was particularly evident nearly all summer.

NEW TASK FOR LIFEGUARDS--Cleaning algae from Webster Beach. (Photo courtesy Rochester Democrat and Chronicle)

Plate No. 6-5

The accompanying graph shows the average daily attendance trend at Stewart Park Waterfront for the 1956-64 period. In 1963 swimming was prohibited at the Stewart Park facility. The following year the Cayuga lakefront beach again open for swimming; however, conditions necessitated reclosing the beach, and it has not been open for public swimming the past two seasons.

Plate No. 6-6



* NOTE: In 1963, the beach was closed. Attendance figure used above was for indoor swimming at Ithaca Senior High School.

Source: 44

Plate No. 6-7

Swimming in Cayuga Lake at Stewart Park was popular during the 1950's. This beach is no longer in use due to water pollution. (Upper photo courtesy Ithaca Youth Bureau; lower photo by BOR)

WARNING!
Prohibited
THESE
POLLUTION
AND
FOR BATHING

Plate No. 6-8 *Photo by BOR*

Seneca Lake -- City of Geneva. For the past decade, the Geneva City Beach on the north shore of Seneca Lake has been posted intermittently as unsafe for swimming. These postings are made by the City Health Department whenever water samples show high bacteria counts. As many as sixty "unsafe" signs are periodically placed along the city's shoreline. The principal source of poor water quality is the city's primary sewage treatment plant discharge. Although the end of the outfall line lies 438 feet offshore (2), the effluent emptied into the lake after a period of precipitation is not adequately treated because the capacity of the city's combined sewer facility for storm runoff and for sewage is exceeded. The excess is discharged without treatment. This waste normally persists three to five days following a period of runoff. In addition, the direction of wind can cause variations in the intensity of pollution.

In the August 13, 1965 issue of the Geneva Times, City Health Officer, Dr. Edgerton Deuel said: "Posting of the Geneva shoreline area does not mean swimming is prohibited or absolutely forbidden, but it's more of a warning and you swim there at your own risk." It is not uncommon to see several hundred bathers using the city beach on a hot summer day. But the majority of the swimming demand in the Geneva area is satisfied at Seneca Lake State Park where annual attendance has averaged over 80,000 for the past five years. Seneca Lake State Park Beach, located approximately two miles east of the Geneva City Beach, has not been plagued by high coliform counts. Favorable wind and water currents carry the Geneva City effluent away from the State Park Beach.

Oneida Lake -- Verona Beach State Park. Oneida Lake is one of the most heavily fertilized water bodies in the eastern United States (186). As a result, swimming at Verona Beach State Park is far from a quality experience. Unpublished data (80) for Verona Beach State Park discloses that the beach was plagued with algae, seaweed, dead fish, and other debris for 70 percent of the 1964 season. A daily log prepared by the park superintendent indicated maintenance crews had to clear the beach prior to its opening on 58 days during the 1964 summer season. In fact, water quality conditions became so unsightly and malodorous on five separate days that the park superintendent displayed a "poor swimming" sign at the park's entrance. On these particular days, the number of swimmers in comparison to total gate attendance dropped nearly 20 percent over the seasonal average.

This state park was bothered by heavy infestations of midges (Chironomidae) and mayflies (Ephemera) for 37 of 84 days during the 1964 season. The annual flight of mayflies (locally known as eelflies) during early summer is spectacular, involving countless numbers. It is not unusual to find nearby park buildings and private cottages blanketed with mayflies. Being weak fliers, mayflies fall in great numbers on the lake surface and with their exuviae wash ashore to accumulate in windrows. Fetid odors also associated with these accumulations have a depressing effect on beach use (53, 101). The midges are similar to mosquitoes in that they irritate recreationists by piercing the skin and sucking blood (114). Midges and mayflies do not preclude the recreational use of the beach; but, when present in large numbers near water areas, they create a displeasing experience for swimmers.

Onondaga Lake. Onondaga Lake is the most grossly polluted lake in the entire basin (186). Situated on the northwest side of Syracuse, Onondaga Lake receives effluent from municipal treatment plants serving the metropolitan Syracuse area. Significant amounts of sewage in overflows from combined sewers also reach the lake via Onondaga Creek and Harbor Brook. On the west shore a major chemical industry discharges vast quantities of inorganic solids to the lake (186). These sources of pollution are primarily responsible for the absence of swimming facilities on this 2,560-acre lake.

Even though Onondaga Lake Park contains 430 acres which stretch for six miles along the northern and eastern shore of the lake, swimming or wading in the lake waters is not sanctioned or supervised by the Onondaga County Division of Parks and Conservation (100). The demand for swimming is present, but pollution of the lake has caused county officials to refrain from developing swimming facilities.

A century ago, the major uses of the lake included swimming and other recreation activities. As early as the turn of the century, additive elements from municipal sewage and chemical residues were causing the lake to age rapidly thereby seriously degrading the bathing experience (101). Even today ". . . it is a common sight to see children swimming in the outlet waters on summer afternoons," reports the Onondaga Lake Scientific Council in a recent publication (102). Since its formation in 1965, the Council has spearheaded a campaign to clean up the lake. The degree of cooperation by governmental agencies, industries, academic institutions, news media, and the public on this project will prognosticate to the large extent the final results of making Onondaga again a healthly, vibrant, recreational lake.

WATER QUALITY INFLUENCES ON BOATING AND ASSOCIATED ACTIVITIES

The principal criteria for water used for boating is that the water be free of objectionable color, odors, and floating or submerged solids and that the water not cause damage to the craft (109). The technical committee of the Great Lakes-Illinois River Basins Project also suggests that the coliform content of water used for boating should not exceed 5,000 per 100 ml (185).

As a recreational activity, boating may be divided into several categories which involve other water-dependent activities. Such a division includes: water-skiing, scuba diving, canoeing, sailing, fishing, hunting from a boat, and cruising for pleasure. Since water-skiing and scuba diving involve body contact, water quality requirements should be the same as those for bathing. Unlike swimming, water skiing can be carried out at some distance from shore. This enables the skier to escape the heaviest concentrations of pollution-associated material which is usually located closer to shore. The growth of algae and other aquatic plants in the lakes of the basin poses a particular hazard to water-skiers. In the fall of 1965 the aquatic weed situation became so intolerable for water-skiers and recreationists on Seneca Lake that a select committee on weed control of the Seneca Lake Waterways Association suggested that a weed harvester be used as an immediate solution to the problem (50).

Boating is significantly affected by low quality water in the lower Niagara River. According to Mr. Arthur B. Williams, General Manager of the Niagara-Frontier State Park Commission, the lower Niagara River is ". . . very heavily polluted by the City of Niagara Falls, New York, and by residents along the river who discharge raw sewage directly into the river. The Niagara River below the power plants has some of the best boating and water-skiing areas in the region if the pollution were not so severe. This is also a factor that affects the propagation of wildlife and fish in the river."

Pollution from the use of toilets on pleasure craft is negligible when compared to industrial wastes and municipal sewage discharges. Yet, in areas of extreme congestion such as marinas, ports, and harbors, unregulated disposal of wastes from boats is a significant problem. Section 13 of the River and Harbor Act of March 3, 1899, (33 USC 407) provides that it is unlawful to discharge refuse from watercraft; however, liquid waste discharges are apparently acceptable. One of the provisions of the Clean Water Restoration Act of 1966 (P.L. 89-753) authorizes a watercraft pollution study. This study will investigate the extent of pollution of all navigable waters in the United States caused by litter and sewage discharged, dumped, or deposited from watercraft. By July 1, 1967, the Secretary of the Interior is to report the findings and present recommendations for necessary legislation.

A recent New York State Law states: "It is unlawful to place, throw, deposit or discharge, or cause to be placed, thrown, deposited or discharged into waters of the state from any watercraft, marina, or mooring any untreated sewage or litter" (105). This law also provides that by June 1, 1968, no toilets on watercraft may be used unless equipped with pollution control devices to prevent the discharge of untreated human wastes into the water. Chlorinators, holding tanks, incinerators, or other devices will satisfy this requirement, provided the device conforms with applicable public health standards of the New York State Health Department.

A recent questionnaire survey made by the pollution committee of the National Association of State Boating Law Administrators (63) concluded that the litter* problem was of greater concern than the problem of sewage disposal.

The report stated:

> American ingenuity being what it is, it appears that food and beverage containers are becoming more and more indestructible. Milk cartons, beverage cans and bottles, and other food containers are not only extremely resistant to deterioration through exposure to the elements, but most of them float, resulting in their accumulation on the beaches adjacent to heavily used waterways. Even when the items washed up on the beach are not necessarily dangerous to humans, they offend the senses because they are so foreign to the area. Since they do not appear to naturally waste away and since they are not capable of being eaten by fish, fowl, or wildlife, the only way they can be removed is through human action and such is difficult, if not impossible, when the cost of patrolling the thousands of miles of shoreline of this nation is considered.

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*Litter here implies trash, cans, garbage, wood, and other floating debris.

To combat the litter problem on Seneca Lake, the Seneca Lake Waterways Association distributed 24,000 litter bags last summer to boat users through marinas serving the lake (38).

WATER QUALITY INFLUENCES ON FISHING

The influence of water quality on fishing can be seen in three general areas: (a) the change in species composition, (b) the alteration of fisheries habitat, and (c) the esthetic quality of the fishing experience. The more desired game fish such as pike, trout, and muskellunge are being substantially replaced in the sportsman's creel by lesser desired species of yellow perch, channel catfish, and carp. The influence of esthetics on fishing is more subtle and hard to define. Odors, littering of the basin's shorelines, and the general knowledge that pollution is present certainly has an effect on the quality of the fishing experience.

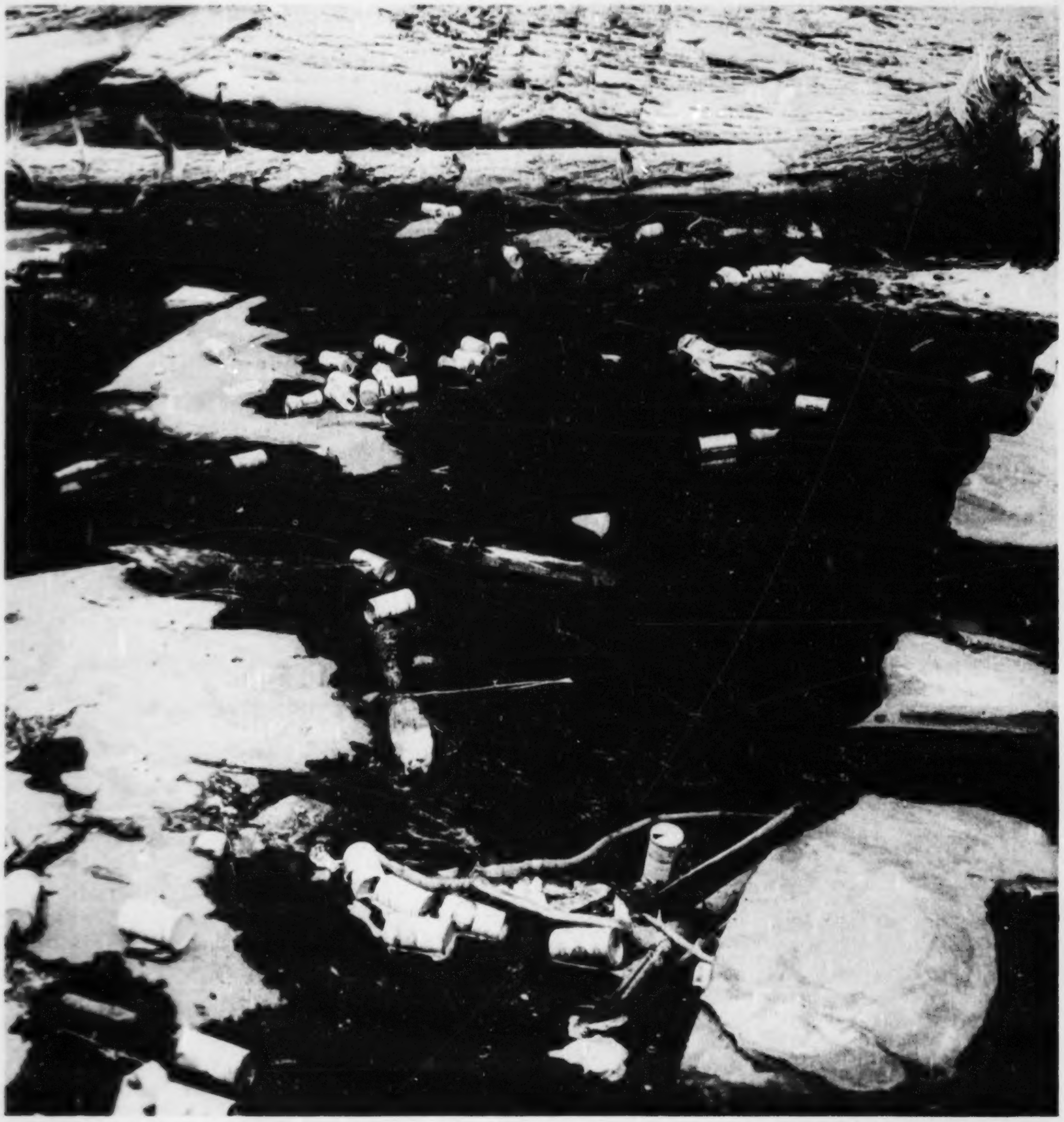
The insidious degradation of Onondaga Lake and its depressing influences on swimming have been most evident; however, sport and commercial fishing have also been affected significantly. In 1872 Onondaga Lake was stocked with a mixture of 11,000 salmon, trout, and bass. By 1893 increasing quantities of chemical wastes and residues discharged directly into the lake virtually eliminated these species. In the first annual report (1895) of the Commissioners of Fisheries Game, and Forests of the State of New York, it is shown that commercial fishing in Onondaga Lake had dropped from approximately 20,000 pounds in 1884 to only 1,000 pounds in 1885 (102). An article appearing in the Syracuse Herald of January 6, 1901, described the Onondaga Lake whitefish as ". . .one most delicious of dishes - it is now out of existence" (101).

WATER QUALITY INFLUENCES ON WATER-ENHANCED ACTIVITIES

McKee and Wolf (52) have delineated the water quality requirements necessary for esthetic enjoyment of water-enhanced activities. Water quality conditions that adversely affect water-enhanced activities are visible floating, suspended, or settled solids arising from the disposal of sewage or garbage; sludge banks; slime infestation; heavy growths of attached plants or animals; blooms or high concentrations of plankton; discoloration or excessive turbidity from sewage, industrial wastes, or even natural sources; the evolution of dissolved gases, especially hydrogen sulfide; visible oil or grease, including emulsions; excessive acidity or alkalinity that leads to corrosion or delignification of boats and docks; surfactants that foam when the water is agitated or aerated; and excessive water temperatures that cause high rates of evaporation and cloudiness over the water (52). Plate No. 6-9 shows the wanton blemishing of the recreation resource landscape. Acts of this nature directly affect the esthetic enjoyment of water-enhanced activities in the basin.

Plate No. 6-9

"The Great American calling card lines the bottom of Big Stream Creek at a once popular swimming spot near Glenora. The beer cans are an outward sign of man's carelessness toward water--his most valuable resource." (Quote and photo courtesy Geneva Times)



ESTHETIC DEPRAVATION - LANDSCAPE DEGRADATION - PROPERTY DEVALUATION

The lower Genesee River has deteriorated esthetically in the past decade, possessing many of the symptoms mentioned in the preceding paragraph. However, remedial action was initiated last summer when the city of Rochester set in motion their community beautification plan, a major thrust of which is to improve the Genesee River corridor. The Rochester Gas and Electric Company, who has a Federal Power Commission application pending for installation of power and generation facilities on the Genesee within the city, proposes to improve the existing waterfront conditions by creating two reflecting pools and by developing other scenic features.

OTHER ADVERSE EFFECTS OF POOR WATER QUALITY

Hasler (36) has defined eutrophication as the intentional or unintentional enrichment of water. Other sources (172, 173, 189) indicate that eutrophication is simply a biological lake-aging process. Eutrophication becomes evident as the concentration of nutrients increase, thereby stimulating the growth of planktonic algae. An overabundance of this algae results in a green murky water surface often producing unpleasant odors and unsightly scums. During the 1964 summer this condition prevailed eleven days at Verona Beach State Park on Oneida Lake.

From a survey made by FWPCA in the summer of 1965, approximately 20 square miles or one-fourth of the Oneida Lake surface was covered by some type of plant growth. Records show that nuisance algae conditions have always been a problem on the lake but not to the extent experienced in recent years. A comparison of recent data with that of a study made in 1918 indicates that the suspended organic matter has increased more than fivefold, and that the types of algae have changed from the relatively harmless free diatoms to undesirable blue-greens. In the summer of 1965 nitrate concentrations ranged from 0.15 to 0.30 milligrams per liter (mg/l) and phosphates from 0.2 to greater than 1.0 mg/l (186).

A lake undergoes natural eutrophication as nutrients that support algal growth enter the lake from the watershed. As the concentration of nutrients becomes greater, the density of algal growth increases proportionally. Of the nutritive elements and dissolved substances known to be used by algae, phosphorus and nitrogen are most often critical (122). When these nutrients are present in unusually large quantities, a lake will support large populations of annually recurring algae. In a series of studies made by C. N. Sawyer in southern Wisconsin, phosphorus was found to be a key element in the fertilization of natural bodies of water (125, 126, 127).

In terms of their nutrient content, all of the Finger Lakes exhibit signs of eutrophication (158). Table No. 6-2 summarizes the average nitrogen and phosphorus concentrations based on samples collected by the FWPCA in the summer and fall of 1965. Nitrogen and phosphate concentrations are well above the critical requirements for abundant algal growths (186)*.

Table No. 6-2

AVERAGE NITROGEN, PHOSPHATE CONCENTRATIONS
IN THE FINGER LAKES, 1965
(milligrams per liter)

Lake	Inorganic Nitrogen	Phosphate as PO_4 Total	Phosphate as PO_4 Soluble
Otisco	0.50	0.06	0.02
Skaneateles	0.75	0.02	0.01
Owasco	0.76	0.03	0.02
Cayuga	1.04	0.04	0.02
Seneca	0.63	----	----
Keuka	0.36	0.04	0.01
Canandaigua	0.50	0.03	0.02

Source: 186

Municipal sewage is the principal source of the nutrient problem in the basin (186). Since detergents are composed of 70 percent phosphorus, municipal sewage laden with this chemical element promotes algal growth. Millions of pounds of waste detergent pour into Lake Ontario every year (40). With each pound of soluble phosphate (PO_4) capable of growing 100,000 pounds of algae under favorable conditions, the demand placed on available oxygen by algae increases tremendously (175). Not only does this aquatic growth reproduce at an explosive rate, but it also kills desirable water-cleansing bacteria. When algae dies, it sinks to the bottom and releases its phosphate to grow another crop of algae (40). Past waste treatment methods have failed to extract a large amount of the phosphates economically.

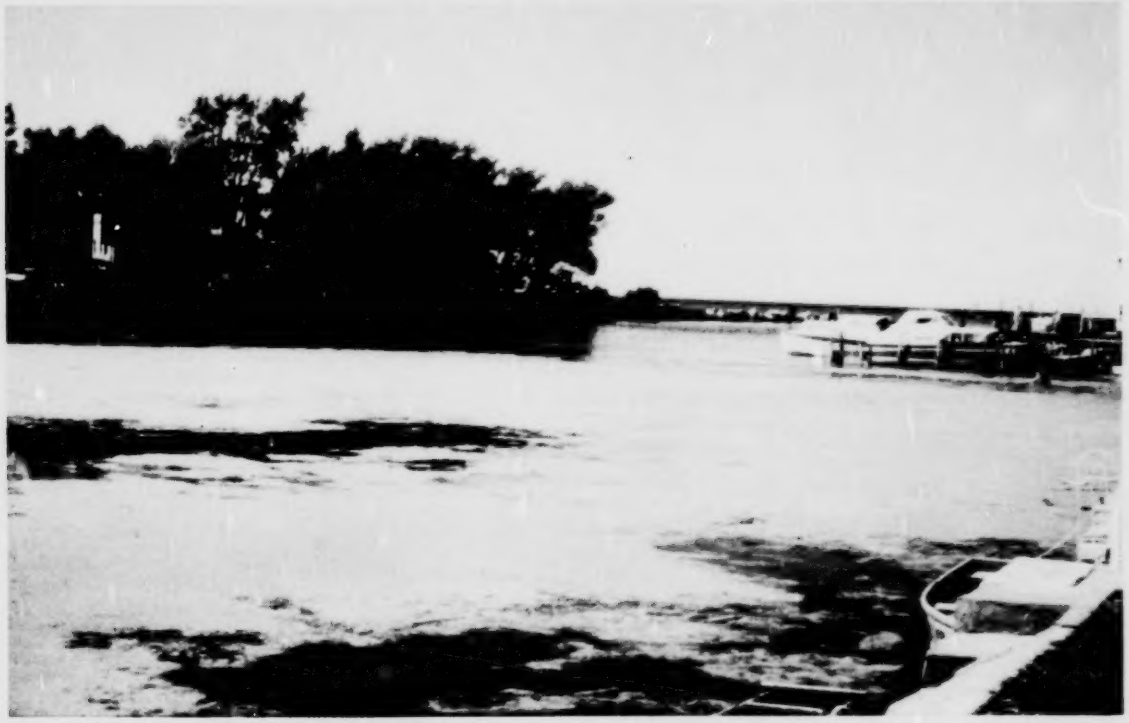
*Sawyer (126) in studies of Wisconsin lakes concluded that concentrations in excess of 0.01 mg/l of phosphorus (0.03 mg/l as total phosphate) and 0.30 mg/l of inorganic nitrogen in ponds and lakes at the time of spring overturn would probably foster the production of nuisance blooms.

However, a breakthrough may be near as FWPCA officials are experimenting with operational procedures at several waste treatment plants around the country patterned after the results of a serendipitous discovery at a secondary sewage treatment plant in San Antonio, Texas (51).

Other significant sources of the phosphorus nutrient problem in the Lake Ontario Basin are industrial wastes, overflows from combined sewer systems, runoff from urban and rural areas, unsewered cottages, and wastes from commercial and private vessels (186). While owners of cottages along the shores of the basin have in many areas been adversely affected by pollution, they have also been partially responsible for it. Many lakeshore communities do not have collection systems or waste treatment plants but rely upon individual septic tanks for waste disposal. Poorly designed and overburdened systems in such areas often leak effluent into adjacent lake water. A result of this situation can be seen on Plate No. 6-10.

Plate No. 6-10

Algal bloom, caused by overfertilization, on Orchard Creek at Point Breeze. (Photo courtesy Federal Water Pollution Control Administration)



Of particular note in coping with water pollution and the ensuing nutrient problem in the Oswego Subbasin is the action taken by the communities bordering Keuka Lake. In order to maintain excellent quality water*, the two villages and six townships adjacent to Keuka Lake adopted in 1964 uniform watershed regulations sponsored by the Keuka Lake Shore Property Owners, Inc. (37). This nonprofit corporation, with over 900 members, represents approximately 36 percent of Keuka Lake homeowners. The corporation hires a watershed inspector to enforce lake contamination ordinances.

The results of their efforts in this pollution control program are now becoming evident. In relation to the other lakes of the Finger Lakes group, Keuka Lake has the lowest inorganic nitrogen concentration and ranks lowest along with Skaneateles Lake in soluble phosphates. See Table No. 6-2. The aggressive action of the Keuka Lake Shore Property Owners, Inc., is playing a vital role in limiting the nutrient problem which plagues not only the Finger Lakes but many other basin inland lakes as well.

An interesting feature in the production of nitrogen and phosphorus is the correlation between the presence of insects such as midges which inhabit a lake bottom as larvae and the nutrient content of the lake. Two professional journal articles (123, 199) substantiate the belief that the heaviest midge producing lakes are those likely to receive the most inorganic nutrients. In eutrophic bodies of water, such as Oneida Lake, a close association can be drawn between the presence of midges and the superabundance of algae and aquatic plant growth. The essence of this type of nutrient problem appears to be a self-generating cycle in which midges serve as catalysts.

WATER QUALITY IMPAIRMENT

In chapter 1 water pollution was defined as the addition of any material or any change in quality or character of a body of water which interferes with, lessens, or destroys a desired use. This implies that if there is no impairment of use, there is no pollution. Last summer at public hearings in Rochester and Syracuse, the FWPCA in their report, "Statement on Water Pollution in the Lake Ontario Basin," produced documentary evidence that a variety of sources have contaminated the waters of the basin. Many of these sources have actually impaired the basin's waters for recreational purposes. Plate No. 6-11 shows present degrees of impairment. These degrees have been divided into three categories; light, moderate, and gross. Definitions of these follow:

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*The New York State Water Pollution Control Board has assigned Keuka Lake the "AA" classification which requires only chlorination to make the water satisfactory for drinking purposes. The villages of Hammondsport and Penn Yan chlorinate the water taken from Keuka Lake prior to human consumption; no filtration process is necessary. Many home owners use untreated water directly from the lake.

WATERS LIGHTLY IMPAIRED are those which can support recreational activities involving whole body contact. In some instances these waters may not be esthetically pleasing during part of the recreational season because of certain activities such as: mining, gravel washing, canning, sewage treatment, or similar activities.

WATER MODERATELY IMPAIRED are those where recreational activities involving whole body contact with water are prohibited. Some persons might engage in water activities involving partial body contact, but most people would shy away from such activity.

WATERS GROSSLY IMPAIRED are those which most people involved in water recreational activities would shun. Such waters would be esthetically displeasing because of algae growth, dead fish, oil slicks, floating debris, raw sewage, or other similar conditions.

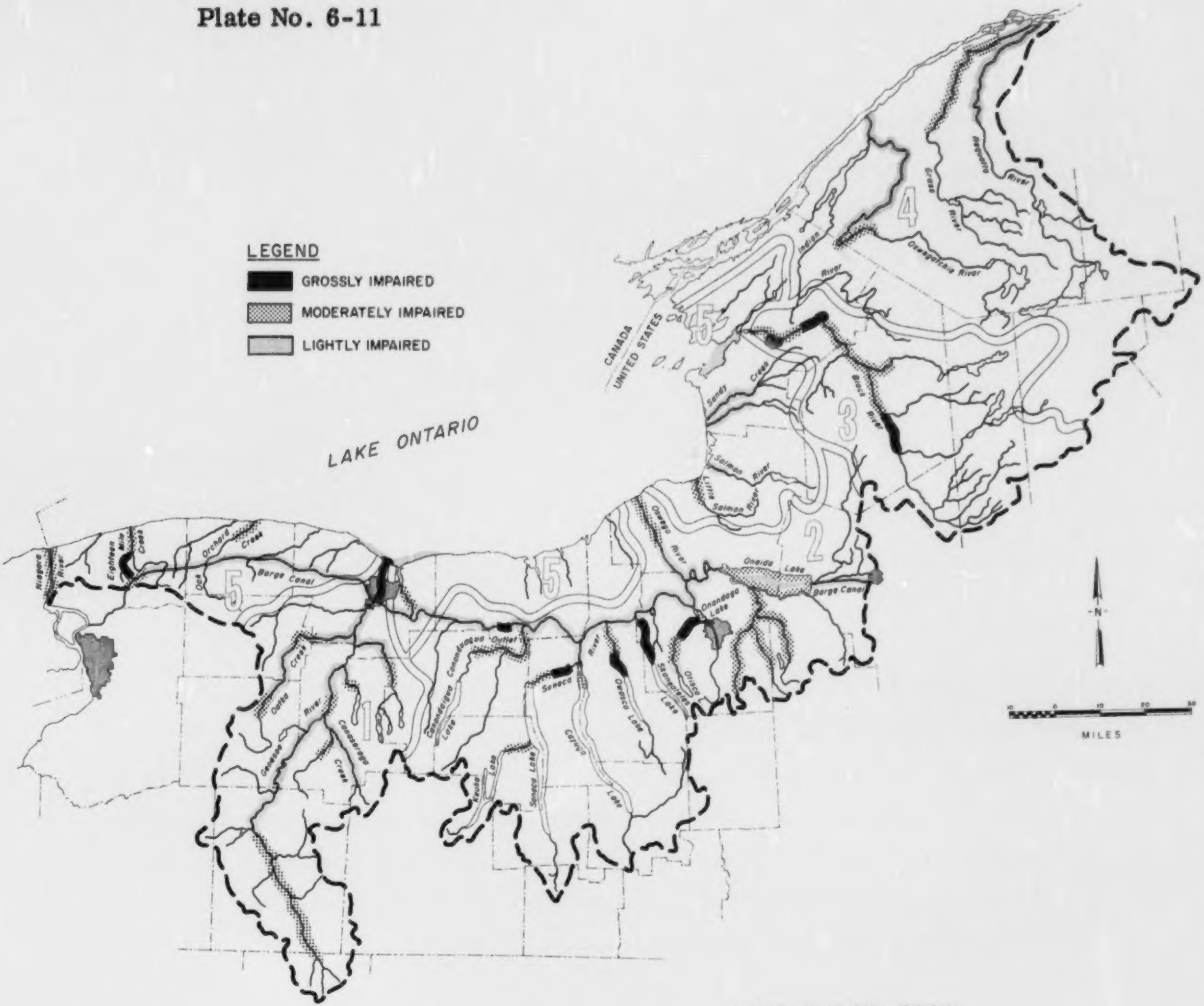
By utilizing these definitions and by assigning the impaired recreation waters of the basin into one of three categories, the following estimates represent the number of miles of shoreline adversely affected by low quality waters.

Lightly Impaired	914 miles
Moderately Impaired	615 miles
Grossly Impaired	116 miles
Total Impairment	1,645 miles

TANGIBLE LOSSES TO RECREATION

Swimming. Previously this chapter discussed the influence of poor water quality on Onondaga Lake. To assess the significance of tangible losses to swimming because of this condition, it is necessary to make three assumptions: (a) Onondaga

Plate No. 6-11


LEGEND
GROSSLY IMPAIRED
MODERATELY IMPAIRED
LIGHTLY IMPAIRED
LAKE ONTARIO
CANADA
UNITED STATES
Niagara River
Eighteen Mile Creek
Orchard Creek
Oak Orchard Creek
Barge Canal
Oatka Creek
Genesee River
Canaseraga Creek
Canandaigua Lake
Canandaigua Outlet
Keuka Lake
Seneca Lake
Seneca River
Cayuga Lake
Owasco Lake
Skaneateles Lake
Otisco Lake
Onondaga Lake
Oneida Lake
Oswego River
Salmon River
Little Salmon River
Sandy Creek
Black River
Indian River
Oswegatchie River
Grass River
Raquette River
1
2
3
4
5
N
MILES

LAKE ONTARIO BASIN

LOCATION OF RECREATIONAL WATERS IMPAIRED BY LOW QUALITY

Source: FWPCA, LOPO

Lake would be suitable for water contact activities; (b) beach facilities would be provided for public use at the lakeside park; and (c) the 1965 attendance at Onondaga Lake Park would have increased by 150 percent if beach facilities had been provided for swimming and sun-bathing*.

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* This estimate is based on findings from the Lake Erie Basin Report (203) and unpublished data received from the Central State Park Commission, Genesee State Park Commission, and Thousand Islands State Park Commission (80, 81, 83).

Table No. 6-3

PROJECTED ATTENDANCE AT ONONDAGA LAKE PARK FOR SWIMMING AND SUN-BATHING PROVIDED THAT IMPROVED WATER QUALITY CONDITIONS EXISTED
(Recreation Days)

Year	Beach Attendance with Improved Water Quality
1965	1,050,000
1970	1,500,000
1975	1,950,000
1980	2,400,000
1985	2,850,000
1990	3,300,000
1995	3,750,000
2000	4,200,000
Total (including intervening years)	94,250,000

Table No. 6-3 lists projected attendance at Onondaga Lake Park should an effective water pollution control and abatement program be instituted. Improved facilities, necessary to meet future demands, were also taken into consideration in establishing these projections. As illustrated, the total accumulative attendance in recreation days over the 35-year period, 1965-2000, could approach 95,000,000. Not until Lake Onondaga is safe for water-dependent activities can this potential be realized. Hence, the projected visitation figures are actually annual loss figures.

The Onondaga Lake Scientific Council recently estimated that 26 million dollars would be required to reclaim the once beautiful, pristine lake (102). If a value of one dollar* per recreation day is assigned to the projected beach attendance shown in Table No. 6-3, by the year 1988, the gross return for swimming alone would amortize the $26 million clean up investment, including five percent interest compounded annually. Obviously, other water-dependent activities, such as fishing and boating, because of improved water quality would reap supplemental benefits. In addition, it would be worth thousands of dollars each year for industries to draw upon the waters of the lake. For example, Allied Chemical Corporation spends $500,000 to condition Onondaga Lake's polluted waters each year (102, 159).

Based on the specific examples cited earlier in this chapter, the immediate benefits of improved water quality to swimming in the basin can be estimated. The data presented in Table No. 6-4 are based on 1965 attendance, facilities, and conditions. This analysis reveals three cogent findings: (a) basin attendance reached 1.2 million at public beaches where poor water quality commonly exists (Plate No. 6-2); (b) approximately 2.3 million recreation visits to the basin's public beaches could have been gained under improved water quality conditions; (c) visitation to the basin's public beaches would have increased 62 percent over the present use with improved water conditions.

Another factor for consideration is the monetary benefits recreation accrues where there is good quality water as opposed to the losses it incurs with poor quality water. This type of evaluation is difficult since judgments are personal and the recreational value of water is determined by people's decisions whether to use it or not. An arbitrary assessment of $1.00 per recreation day of swimming in good quality water or of $0.50 per recreation day of swimming in poor quality water is at best a subtle approach. However, there are significant indications that people do place a higher value on good quality water than on poor quality

Table No. 6-4

INFLUENCE OF WATER QUALITY ON SWIMMING AT PUBLIC BEACHES IN THE LAKE ONTARIO BASIN, 1965*

(Estimated activity occasions)

1. Attendance at public beaches exhibiting poor water quality	1,160,000
2. Attendance at public beaches not exhibiting poor water quality	2,519,000
3. Total estimated visitation at the basin's public beaches	3,679,000
4. Increase in attendance with improved water quality	2,261,000
a. reopening of closed beaches	33,000
b. increased participation by present patrons	589,000
c. increased attendance of present nonpatrons	1,639,000
5. Annual loss without improved water quality conditions and with enforcement**	3,421,000
6. Estimated total swimming visitation with improved water quality***	5,940,000

* Data were obtained from the following sources: 44, 60, 80, 81, 83, 102, 181, 184.
** Total of 1 and 4
***Total of 2 and 5

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* Supplement No. 1 (169) to Senate Document No. 97 (168) of the 87th Congress provides a range of values ($0.50-$1.50) for general recreation activities to be used in evaluating out door recreation benefits.

water. But the probability of translating subjective judgments into monetary terms is, nonetheless, remote. Conclusions that people prefer good quality water for swimming and that economic gains accrue from the recreational use of good quality water are supported by the following three points:

1. For the past five years the average number of swimming lessons taught at the Monroe County public beaches, which frequently exhibit poor water quality, dropped 62 percent below the previous five-year period, 1957-61 (60).

2. In the summer of 1966 pollution at Rochester area beaches resulted in a 300 percent increase in swimming pool sales over the previous year's business while the demand to join private swim clubs far exceeded capacity (119). Private pools range in cost from $40 for a portable above-ground pool to over $10,000 for an excavated pool. In Irondequoit, a middle-income suburb of 55,000 east of Rochester, 117 new pools were installed on private property in 1966, bringing the total to about 1,100 pools (119) or approximately one private pool for every 50 residents.

3. Poor quality water has caused a loss in sales to businesses established in the vicinity of recreation areas where pollution is a recognized fact. Many concessionaires suffered financial losses when visitation to Ontario Beach (Monroe County) dropped more than 57 percent during a period extending from the last week in June 1966 to the first week in July. Full time employees were placed on part time and/or part time help was layed off. Because volume of sales declined as much as 60 percent, many establishments were forced to close one to two hours earlier (8).

Boating. Transported, eroded materials deposited as sediment create downstream damages to waterways and recreation facilities. Each year this deposition in channels and in harbors represents significant social (monetary) losses in the basin. In a few instances, sedimentation has precluded the use of water-dependent recreational facilities. Admittedly, recreation is but one sector of the basin's economy that suffers from sedimentation; nevertheless, financial losses accrue to the owner of the recreational facilities as well as the recreationist. Plate No. 6-12 shows an aerial view of a private marina in Irondequoit Bay. The facility is no longer usable because of siltation, and would cost the marina operator approximately $25,000 to dredge. Consequently, the individual boat owner (a) is denied the use of the facility until it is dredged and (b) spends more time in travel if he cannot locate a mooring facility closer to his residence or (c) might have to pay a higher rental rate to the marina operator to offset the expenses from dredging.

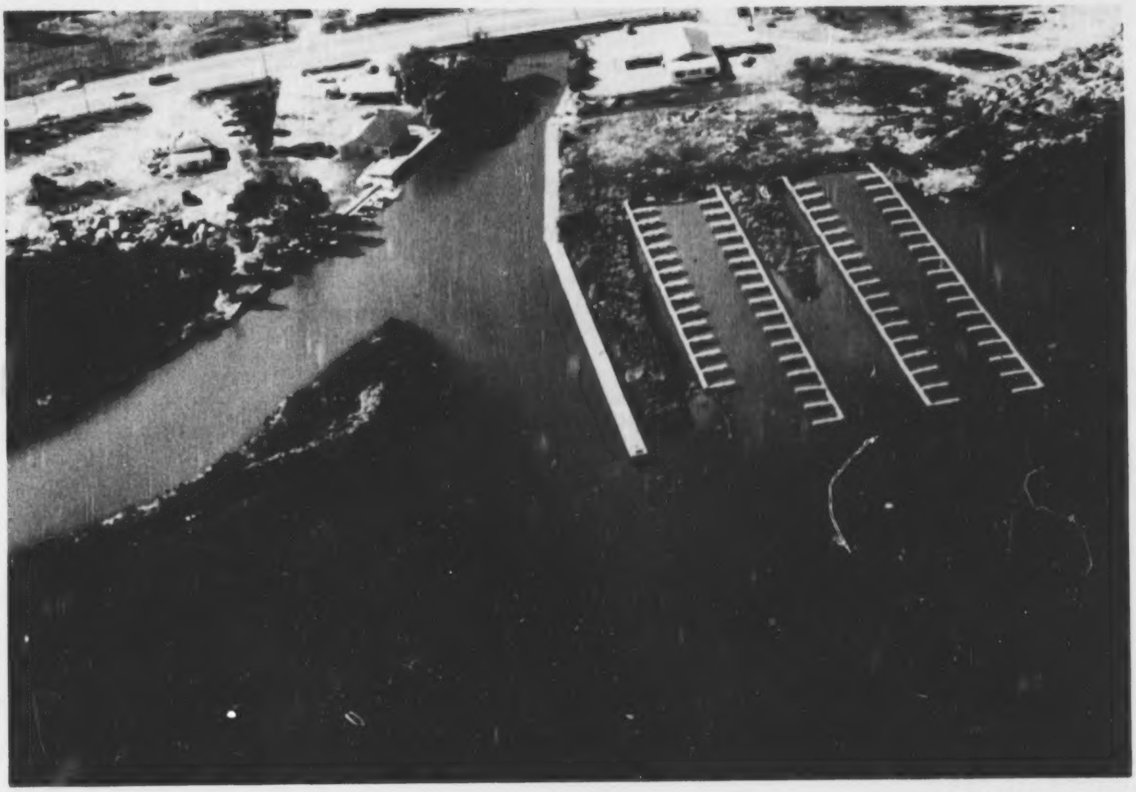
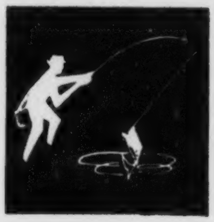


Plate No. 6-12

A privately owned marina temporarily out-of-business due to siltation. (Photo courtesy Federal Water Pollution Control Administration)



Chapter 7
Outdoor Recreation Plan

APPRAISAL OF RECREATION POTENTIALS

From the foregoing chapters dealing with physical and socio-economic factors, it is apparent that outdoor recreation is playing and will continue to play a leading role in the natural resource development of the Lake Ontario Basin. The demand for water-oriented outdoor recreation in each of the basin's five zones exceeds the existing supply of outdoor recreation facilities.

Positive action programs have been skillfully proffered and enthusiastically implemented by the state in an effort to meet the recreation needs of the basin's residents as well as those of the remainder of its citizens. To supplement these, a New York State coordinated program for the use of water resources was prepared in June 1966. Laws, policies, and current studies relating to the state's intra- and interstate waters were considered in formulating this program. Of particular significance is the Pure Waters Bond Act of 1965 which initiated a 6-year comprehensive program for the elimination of water pollution in lakes, streams, and rivers.

In light of a current deficiency in recreational acreage requirements and considering the capacity of the basin's resource base, Table No. 7-1 presents an evaluation of the basin's ability to meet future needs. This assessment considers total existing land and water resources for all levels of government; it appraises the availability of potential areas to cope with the basin's surging unsatisfied demand. Since complete information and data were unavailable, the private recreation sector in toto received only superficial consideration.

Although the technique employed in this appraisal is subjective, the value judgments made with respect to the demand for the various recreational activities of each zone were considered in relation to the resource base. This provides a measure of potential attainment without regard to political decisions from various governmental levels. This superficial review indicates that the long range capacities of Zones 1, 3, and 4 can conceivably satisfy future resource requirements.

Zone 5 is now experiencing acquisition problems and by 1976 will encounter greater obstacles. The greatest potential of this zone lies along the Lake Ontario shoreline which even now is dominated by private development. Of approximately 315 miles of shoreline, about 10 percent has been or will be acquired by 1976 for public recreation areas. This is still short of the recommended 15 percent which the National Park Service, in their 1958 report (194), considered optimum to satisfy public recreation needs.

From a recreational standpoint the Oswego Subbasin (Zone 2) has a varied and abundant resource base; however, the historical development of the private sector, especially in the Finger Lakes region, has somewhat limited the initiative of public agencies in establishing recreation areas. To what degree this may be altered in the future will depend largely upon political decisions and financial outlays. Without a concerted and coordinated effort it appears that the task of meeting the recreation resource requirements in Zone 2 will be the most difficult.

Table No. 7-1

PROBABILITY OF ATTAINMENT OF FUTURE
REQUIREMENTS FOR DEVELOPED RECREATIONAL ACREAGE
LAKE ONTARIO BASIN*
(in degrees of probability)

Zone	1976	2000
1	Excellent	Good
2	Fair	Fair
3	Excellent	Excellent
4	Excellent	Excellent
5	Good	Fair

*"With opportunity" factor (as defined in ORRRC Report No. 26) assumes an improvement from 1960 quality and quantity of facilities on a per capita basis.

ESTABLISHMENT OF OBJECTIVES

To facilitate a plan of action, it is essential that objectives be established. Normally, priorities are set forth in the procedural approach to attain these objectives. By so doing, attention can be focused upon specific recreation resource problems which require efficient and effective action. To enhance the basin's recreation resources, three major problem areas require immediate attention. These areas and the strategies for improving their existing conditions are listed in the following outline:

1. Day-use Facilities.

a. Water pollution abatement at Rochester area beaches on Lake Ontario for whole body contact sports*.

b. Water pollution abatement to upgrade Onondaga Lake for whole body contact sports*.

c. Water pollution abatement at Geneva City Beach on Seneca Lake and at Ithaca's Stewart Park on Cayuga Lake for whole body contact sports*.

d. Water pollution abatement to upgrade the lower Niagara River for partial body contact sports*.

e. Acquisition and development of additional recreation areas (particularly for swimming, picnicking, and boating access) to meet future needs, especially near SMSA's and other urban areas in the basin.

2. Overnight or Weekend Facilities.

a. Water pollution abatement at Verona Beach State Park and at other state parks where large masses of algae, mass die-off of fish, water turbidity problems, etc., create frequent nuisance situations at beaches.

b. Acquisition and development of additional state and water-oriented recreation areas (particularly swimming, camping, boating access, and fishing) to meet future needs.

c. Develop additional harbors of refuge along the Lake Ontario shoreline.

3. Natural Beauty Features.

a. Upgrade current segments or stretches of rivers now considered "grossly impaired" recreationally. (See Plate No. 6-11.)

b. Implement waterfront recreation renewal programs along the lower Niagara River, the lower Black River, and Onondaga Lake and Creek, similar to the action initiated by the City of Rochester along the lower Genesee River.

c. Establish a State "natural or wild rivers" program to preserve the basin's few remaining scenic, free-flowing rivers, e.g., the Black, Moose, and Oswegatchie Rivers.

d. Develop a system of trails along the Barge Canal towpath.

e. Develop additional roadside rest areas and scenic overlooks to accommodate the touring vacationist as well as the resident driving for pleasure on a Sunday afternoon.

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*These pollution abatement measures are among specific recommendations in the comprehensive pollution control program under development by the Federal Water Pollution Control Administration.

SUPPLEMENTAL CONSIDERATIONS

Location of Recreation Facilities. Location is an important factor in considering the merits of a recreation area. People tend to seek the nearest area that offers the desired facilities. This pattern may be altered if an area farther away is more easily reached or offers some outstanding feature. An ORRRC study (111) showed that "time" was the factor most often limiting participation in the majority of recreation activities. In the same survey, 14 percent of the people interviewed said that inadequacy of facilities was the restricting factor, with three-fourths of the complaints related to distance. This indicates that if facilities could be quickly and easily reached, there would be an increase in demand satisfaction.

Recreation resource agencies should make every attempt to locate facilities adjacent to desirable water resources. Activities requiring a water surface are among the most popular in demand and are also among those experiencing the fastest growth. Swimming is a popular activity which should be provided at every opportunity. The ORRRC study shows that swimming is significantly associated with all other outdoor activities; this suggests that swimming facilities would enhance any recreational area. The average attendance at the state parks in the basin which provide swimming is over six times that of those without swimming. In the ORRRC survey (111) a sampling of park visitors were questioned about the satisfactoriness of their recreational experience. Though the majority expressed satisfaction, one-fifth did express some disappointment with their visit. Their complaints centered around the unavailability of water sport facilities.

Resource Management Decisions. Management practices need careful scrutiny. Management greatly influences future demand satisfaction and the popularity of an area. This factor can largely determine the future importance of the private sector. Successful recreation area administration and management depend on skill and training. In management, as well as in planning, more intelligent decisions can be made if surveys are undertaken to determine the preferences of the effective population. Such a survey was conducted by the Thousand Islands State Park Commission regarding camping facilities at parks under their jurisdiction during the 1965 summer season. However, home surveys should supplement on-site surveys to obtain less biased results regarding certain questions such as area design and activity preferences.

Every effort should be made to set aside unique areas for recreational use. Whenever possible, development should include facilities for those activities that are compatible with the primary purpose of the area. Numerous game management areas, multiple-use areas, and state reforestation areas in the basin have very little development at present. Present development does provide an opportunity for such compatible pursuits as fishing and wildlife observation. Additional opportunity could be provided for activities of a passive nature such as picnicking and still be consistent with agency objectives.

To optimize use, changes in tastes, interests, and social institutions must be anticipated and considered as much as possible in planning programs. Future programs must remain flexible to allow for necessary adjustments.

Social Controls. The basin's rapidly expanding development requires that lands and waters presently available for recreation or those under consideration be adequately protected for future recreational use. Protection is necessary not only from competing land uses but also from incompatible uses which could diminish the satisfactions gained from recreational experiences. Proper employment of social controls could preserve recreational qualities and enhance scenic values. Social controls include such land use techniques as (a) eminent domain, (b) easements, (c) zoning, and (d) assessment policies.

In many cases, outright acquisition may be the only effective means of acquiring essential areas and key tracts, possibly requiring the injunctive power of eminent domain. The mere existence of the power of eminent domain, even without its actual use, frequently facilitates negotiated purchase (107).

The easement represents acquisition of rights less than full ownership, and, as such, it allows the resource landscape to remain in its present state of development yet be open to the public for various uses. Easements can be used to provide open space and buffer areas for recreation lands. Scenic easements along certain portions of the New York Thruway have been effective in preserving the natural beauty of the countryside. A 1965 Maryland State Law permits landowners in five southern counties to grant scenic easements on open space in perpetuity for certain tax credits. This type of easement arrangement would be particularly effective along the Lake Ontario shoreline and the shores of the Finger Lakes.

If properly administered and used in conjunction with related controls, zoning presents an effective means of controlling land use. Zoning is an important tool which can be used to preserve areas for recreation use and at the same time permit other compatible land use practices. The present lineal development of private homes and cottages along the Lake Ontario shore as well as along the shores of the Finger Lakes has prohibited public access in many areas. In the future, cluster development should be encouraged wherever feasible along water frontage. In planning future water impoundments, cluster developments should be considered along with zoning and deed restrictions to ensure maximum use and benefit from lands adjacent to water areas.

Closely related to zoning are assessment policies or taxation devices. By assessing open land such as farmland at the value of its current use rather than at its subdivision value, this policy seeks to stem the spiral by which rising land assessment stimulates owners to sell to subdividers, thus further raising the assessment on the remaining open land (107).

Limitation of International Boundary. Since this report considers only the United States portion of the Lake Ontario Basin, the relationship to the Canadian portion of the basin was not explored. A substantial number of Canadian residents use United States recreation facilities and vice versa. In August 1966, New York State and the Province of Ontario adopted regulations to control the discharge of waste by watercraft into Lake Ontario. These points indicate that the International Boundary is not a physical limitation in utilizing natural resources common to the two countries. The existence of the political boundary, however, tends to handicap natural resource planning efforts. A similar study for the Canadian portion of the basin would give a complete overview of water-oriented outdoor recreation in the Lake Ontario Basin.

ACTION PROGRAMS

The range of programs available to accomplish the desired objectives set forth earlier in this chapter for the Lake Ontario Basin is noteworthy. The availability and subsequent use of these requisite tools for and by all levels of government will embrace a greater concerted effort in achieving this study's primary goal--a better quality recreation experience for all.

Federal.

Outdoor Recreation Programs. The Land and Water Conservation Fund Act of 1965 authorizes 50 percent matching grants to states and their political subdivisions for planning, acquisition, and development of outdoor recreation resources. Acquisition and development assistance is available for state and local projects which are in accord with a state's comprehensive outdoor recreation plan. This program is administered by the Bureau of Outdoor Recreation.

Anti-Pollution Programs. The Federal Water Pollution Control Administration has the authority to provide financial assistance to states and municipalities for the prevention, control, and abatement of water pollution through (1) grants for sewage treatment plant construction to 30 percent of eligible project costs (if states provide matching funds and certain other conditions are met, the Federal share may be as much as 55 percent), and (2) grants up to 75 percent of the total cost of facilities that will demonstrate new or improved methods for controlling discharge of waste from storm sewers or combined storm and sanitary sewers. To qualify, such projects must be approved by the appropriate state water pollution control agency (177).

On November 3, 1966, the Clean Waters Restoration Act was enacted. This act provides grants to states for developing a comprehensive pollution control and abatement plan for a basin. Also, certain portions of the Federal Water Pollution Control Act of 1965 were amended which pertained to construction grants to municipalities for sewage treatment plants. Two studies will be made under the provisions of this act: (1) a watercraft pollution study and (2) a study of incentive assistance to industries (160).

Fish and Wildlife Programs. The Dingell-Johnson Program helps states to develop facilities for sports fishing with funds derived from a 10 percent manufacturer's excise tax on fishing equipment. The Federal funds allocated from this program, which are matched by 25 percent state funds, amounted to $184,000 for New York State in Fiscal Year 1965 and $177,000 in Fiscal Year 1966.

Under the Pittman-Robertson Program, states receive grants for improving and restoring wildlife habitat. The revenue for these grants is derived from the proceeds of an 11 percent manufacturer's excise tax on sporting arms and ammunition. These funds also are matched by 25 percent funds from the state. In Fiscal

Year 1965, New York State was allocated $530,000 and in Fiscal Year 1966, $603,000. These programs are administered by the Department of the Interior's Bureau of Sport Fisheries and Wildlife (177).

Water Resource Development Programs. The Federal Water Projects Recreation Act of 1965 (Public Law 89-72), establishes procedures whereby recreation can be included as a purpose in Federal water development projects. Non-Federal public bodies must share the cost of providing recreation lands and facilities and agree to operate and maintain them. Examples of these projects are the potential Corps of Engineers reservoirs in the Genesee River Basin. However, non-Federal cost sharing and recreation administration of Federal reservoir projects are not required in all instances. The alternative is Federal administration, either as part of a national program or with only minimum facilities for public health and safety.

Agricultural Programs. Under the provisions of Public Law 566, the Watershed Protection and Flood Prevention (Small Watershed) Act of 1954, as amended by the Food and Agriculture Act of 1962, the Department of Agriculture may share with state and local agencies up to half the cost of land, easements, and rights-of-way for reservoirs and other areas to be managed by state and local sponsors for public recreation. A small watershed must be less than 250,000 acres. Cost sharing is also available for developing recreation facilities.

Under Section 101 of the Food and Agriculture Act of 1962, the Department of Agriculture can enter into long-term agreements with farmers to convert land regularly used for crop production into recreation projects. Title IV of the Agricultural Act of 1962 permits the Farmers Home Administration to make loans to individual farmers for development of income-producing outdoor recreation enterprises. The F.H.A. may also make loans to nonprofit associations up to $500,000 and insure loans up to $1 million by effecting changes in land use, including the development of recreation facilities (177).

Under Title VI of the Food and Agriculture Act of 1965, the Department of Agriculture can enter into long-term agreements with farmers to convert land regularly used for crop production to practices or uses that will conserve soil, water, or forest resources; to establish, protect, or conserve open spaces, natural beauty, wildlife habitat, or recreational resources; or to prevent air or water pollution. The Department of Agriculture is also authorized to make grants to all levels of government for the acquisition of cropland to preserve open spaces and natural beauty, to develop wildlife habitats and recreational facilities, or to prevent air or water pollution.

The Department of Agriculture cost shares with farmers to control sedimentation of streams, lakes, and ponds, and to provide suitable habitat for wildlife.

Open Space Programs. Title VII of the Housing Act of 1961 as amended by Title IX of the Housing and Urban Development Act of 1965 authorizes grants up to 50 percent of total costs to states and local public agencies for the acquisition and development of open space lands for park, recreation, conservation, scenic, or historic purposes in urban and suburban areas. Land to be acquired must be undeveloped or predominantly undeveloped. Title IX of the same Act also authorizes grants to states up to 50 percent of the cost for acquiring developed lands and clearing them for open space purposes if available undeveloped lands are inadequate to meet the needs of built-up sections of cities (177).

Urban Beautification and Improvement Programs. Under Title IX of the Housing and Urban Development Act of 1965, grants may be made to states and local public bodies to assist in carrying out local programs of urban beautification and improvement. Grants may not exceed 50 percent of the cost of activities in excess of the normal expenditures for comparable activities. Also under Title IX, a maximum of $50 million of the funds is authorized for grants covering up to 90 percent of the costs of projects having special value in developing or in demonstrating new, improved methods and materials for urban beautification and improvement.

State.

Bond Issue Programs. In 1960 New York State voters authorized a $75 million bond issue for acquisition of park and recreation lands. Criteria for this acquisition include: lands for state or municipal parks shall consist predominantly of open or natural lands ". . .on or near suburban areas, or suitable to serve the needs of residents of such areas; lands for other than park use shall be suitable for outdoor recreation, and wherever possible shall serve multiple purposes involving the conservation and development of natural resources, including the preservation of scenic areas, watershed protection, forestry, and reforestation." (Laws of New York 1960, Chap. 523) (178).

Two years later a supplemental $25 million outdoor recreation land acquisition bond issue was ratified by New York State's voters. As a result of the $100 million land acquisition bond program, the state has acquired more than 35,500 acres of state park land, has assisted municipalities in acquiring 31,000 acres of land, and secured 283,000 acres of multiple use and forest recreation areas (205).

Development of these lands was approved by the voters last November. This phase, appropriately entitled "The Next Step," is a $400 million development program. (Two hundred million dollars is earmarked from the bond issue program and $200 million is derived from matching Federal and municipal funds plus state appropriations.) This new 10-year program emphasizes development of water-dependent outdoor recreation facilities.

The Pure Waters Program. A 6-year comprehensive program for the reduction of water pollution in the lakes, streams, and rivers of New York State was initiated in 1965. The objective of this $1.7 billion pure waters program is to accelerate water quality improvement (86). The Pure Waters Bond Act and four other acts constitute the basis for an intensive program to realize the full value of the State's water resources. Specifically, the acts:

1. authorize $1 billion in state debt for the nonlocal share of constructing public sewage treatment facilities.

2. provide state aid of 30 percent and prefinancing of the full Federal share up to an additional 30 percent of the cost of constructing these facilities.

3. allow under State income tax laws in the year of construction a deduction of the total cost of waste treatment facilities constructed by private industry.

4. grant an exemption from local real property taxes for all such privately constructed facilities.

5. streamline and modernize the procedures for enforcing the state's anti-pollution laws (178).

Chapter 8
Conclusions

Considering all the essential elements affecting water-oriented outdoor recreation in the Lake Ontario Basin, the following conclusions are offered:

1. The natural resource base provides an unexcelled variety of lands and waters for recreational use and development.

2. The current annual recreation demand is an estimated 35 million recreation days; by the year 2000 this amount will more than triple and by 2020 a fivefold increase can be anticipated. Approximately one-third of the present demand can be attributed to the vacation sector--an estimated 2 1/4 million people who spend all or a portion of their vacation in the basin.

3. There are more than 365,000 acres of land and water available to the general public for outdoor recreation at 358 areas in the basin. Seventy-nine percent of these areas provide water-dependent facilities.

4. The need for publicly developed recreational acreages is particularly acute in the Oswego Subbasin. Sizeable acreage requirements occur in the Genesee Subbasin and in the Small Streams Tributary Subbasin. A critical shortage of developed facilities exists for swimming, picnicking, and other day-use activities in and near the SMSA's. Also, public campsites, marinas, and attendant harbor facilities are especially needed along the Lake Ontario shoreline, the St. Lawrence River, and in the Finger Lakes area.

5. New York State's $100 million land acquisition bond program and the new $400 million recreation development bond program will alleviate immeasurably the present and future need for more recreation facilities.

6. Effluents from municipal sewage systems and industrial plants have contaminated portions of Lake Ontario and several inland lakes and rivers in the basin to

the extent that some public beaches have been closed to swimming, and the potential development of other recreation areas has been reduced considerably. An estimated 2.3 million activity occasions of swimming are lost annually because of the presence of low quality water at public beaches in the basin. Approximately 1,600 miles of shoreline along Lake Ontario, the Barge Canal, and inland lakes and rivers of the basin are impaired to varying degrees by low quality waters.

7. Inadequate sanitation facilities of private homes and cottages are rapidly contributing to the eutrophication of the inland lakes and the overfertilization of rivers and streams. However, the formation of a private shore property home owners association at Keuka Lake is serving as a catalyst in combating this growing problem at that particular lake.

8. Although water quality classification and criteria for water-dependent recreation activities have been established, regulatory agencies--particularly at the local level--are reluctant to apply them effectively and efficiently.

9. The Pure Waters Program of New York State, enacted in 1965, provides the foundation for renovating polluted recreation waters. The benefits of this program could mean improved water quality for recreational uses near metropolitan areas where the need is the greatest.

Chapter 9
Recommendations

In considering the basin's needs for outdoor recreation opportunities and the extent to which these needs may be met, it is recommended that:

1. Emphasis be given to (a) the acquisition of lands adjacent to the Finger Lakes and along the Lake Ontario shoreline and the St. Lawrence River; (b) the development of water-dependent recreation facilities in and near the SMSA's of the basin.

2. Through the leadership of the Federal Water Pollution Control Administration, all Federal agencies which administer recreational lands and waters assess their individual situations and adopt strong programs of pollution prevention and abatement. Further, state and local governmental agencies, industry, and private organizations utilizing recreational water resources be encouraged to develop and to implement pollution prevention and abatement programs.

3. Direct measures to prevent and to abate pollution at its source rather than dilution methods be stressed since they are more effective in improving the quality of water for recreational use.

4. Existing pollution control and abatement programs be accelerated to reduce the eutrophication of inland lakes and to alleviate the overfertilization of streams, thereby improving the esthetic quality values of recreation.

5. Methods of preventing pollution from siltation by agricultural operations and highway construction be thoroughly investigated. Watershed management and soil conservation practices be intensified and extended as a means of reducing soil erosion and increasing the recreation potential of the basin's water resources.

6. Communities bordering the basin's inland lakes be encouraged to establish watershed regulations prohibiting pollution of the lake's waters. Nonprofit corporations, such as the Keuka Lake Shore Property Owners, Inc., which sponsor and

enforce uniform watershed regulations and coordinate activities relative to the use of Keuka Lake's waters, should also be encouraged.

7. Present water quality standards for water-dependent activities be strengthened through more specific requirements for such parameters as toxic substances, radioactive or flammable materials, oil, grease, turbidity, temperature, and threshold odor levels.

8. An automated surveillance system be installed to monitor intensively used bathing areas such as Rochester area beaches, Verona Beach State Park, Hamlin Beach State Park, and Fair Haven Beach State Park for illicit discharges, accidental spills, and other sources of pollution. At less frequented public beaches, a quick, reliable, and inexpensive field testing kit should be devised to identify and to measure the presence of contaminants.

9. Land use controls be employed (a) to provide public access to the Finger Lakes and along the Lake Ontario shoreline and the St. Lawrence Riverway and (b) to protect recreational waters from pollution, particularly in and near the basin population centers.

10. Efforts be made through the International Joint Commission (IJC) to encourage Canadian cooperation and coordination in carrying forth recreation water pollution prevention and abatement programs.

11. An accelerated public information and education program be developed concerning the role of the public in the protection of waters from pollution.

12. Further research be conducted on the many aspects of the relationship between water-oriented outdoor recreation activities and water quality. The nature of the effects and the extent of endemic outbreaks of infectious diseases as a result of this contact should be thoroughly investigated.

Appendix A

Table Number	Title	Page
A-1	Basic County Data	A-1
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Table No. A-1

BASIC COUNTY DATA
LAKE ONTARIO BASIN

COUNTY	Area (sq. mi.) in County	Area (sq. mi.) in Basin	Population in County	Population in Basin	Population Density Per Square Mile in County	Population Density Per Square Mile in Basin
Allegany	1,048	749	43,978	29,226	42	39
Cayuga	699	699	73,942	73,942	106	106
Chemung	412	62	98,706	2,729	239	44
Cortland	502	30	41,113	1,222	81	40
Essex	1,826	73	35,300	396	20	5
Franklin	1,685	268	44,742	7,058	27	26
Genesee	501	301	53,994	21,524	107	71
Hamilton	1,747	636	4,267	1,342	3	2
Herkimer	1,442	607	66,370	2,178	46	3
Jefferson	1,293	1,293	87,835	87,835	68	68
Lewis	1,293	1,269	23,249	22,727	18	18
Livingston	638	622	44,053	43,407	69	69
Madison	661	345	54,635	38,841	82	112
Monroe	673	673	586,387	586,387	871	871
Niagara	533	373	242,269	81,431	454	218
Oneida	1,227	591	264,401	46,482	216	78
Onondaga	792	757	423,028	420,606	534	555
Ontario	649	638	68,070	68,070	105	106
Orleans	396	396	34,159	34,159	86	86
Oswego	968	968	86,118	86,118	89	89
Potter (Pa.)	1,090	96	16,483	1,651	15	17
St. Lawrence	2,767	2,274	111,239	104,167	41	46
Schuyler	331	209	15,044	11,737	45	56
Seneca	330	330	31,984	31,984	96	96
Steuben	1,408	221	97,691	7,287	70	32
Tompkins	491	427	66,164	63,335	134	148
Wayne	607	607	67,989	67,989	112	112
Wyoming	598	354	34,793	18,249	58	51
Yates	344	332	18,614	18,471	54	55
Total	26,951	16,200	2,836,617	1,980,550	106	123

Sources: 154, 187

Table No. A-2

COUNTY INVENTORY OF NATURAL AND ARTIFICIAL INLAND LAKES*
LAKE ONTARIO BASIN

		Surface Acres					
County	No of Lakes	Zone 1	Zone 2	Zone 3	Zone 4	Zone 5	Basin
Allegany	1	30					30
Cayuga	12		44,586			128	44,714
Chemung	0		0				0
Cortland	0		0				0
Essex	13				1,392		1,392
Franklin	29				31,841		31,841
Genesee	1	23				0	23
Hamilton	138			8,126	22,833		30,959
Jefferson	8			0	2,731	1,176	3,907
Lewis	76		98	2,412	2,209	0	4,719
Livingston	5	10,214					10,214
Madison	2		1,754				1,754
Monroe	9	169				698	867
Niagara	0					0	0
Oneida	17		33	1,529		0	1,562
Onondaga	12		17,218				17,218
Ontario	4	2,339	10,894			0	13,233
Orleans	0					0	0
Oswego	25		53,213			3,007	56,220
Potter (Pa.)	6	627					627
St. Lawrence	197				35,732		35,732
Schuyler	0		0				0
Seneca	5		44,113				44,113
Steuben	0	0	0				0
Tompkins	1		120				120
Wayne	3		85			45	130
Wyoming	2	829					829
Yates	4		12,782				12,782
Total	762	14,231	184,896	29,674	97,665	5,054	331,520

* Note: In cases where a lake lies in two or more counties, only one county is credited with the lake acreage, e.g., Oneida Lake lies in Oswego and Oneida Counties; since a greater water surface area is in Oswego County, Oneida Lake was tallied only for the county.

Sources: 21,188, 191

Table No. A-3

SUPPLY SUMMARY
LAKE ONTARIO BASIN

	No. Areas	No. Water Dependent	No. Undeveloped	Total Land & Water Acre.	% of Total Acreage
ZONE 1					
Federal	1	1	0	6,776	15
State	12	7	4	30,322	70
Local	6	4	1	2,124	5
Private	37	31	0	4,170	10
Zone 1 totals	56	45	5	43,392	12*
ZONE 2					
Federal	1	1	0	13,237	10
State	51	33	17	101,506	82
Local	14	6	4	6,164	5
Private	64	58	0	3,634	3
Zone 2 totals	130	98	21	124,541	34*
ZONE 3					
Federal	0	0	0	0	0
State	15	9	5	85,287	98
Local	0	0	0	0	0
Private	15	14	0	1,603	2
Zone 3 totals	30	23	5	86,890	24*
ZONE 4					
Federal	1	1	0	179	1
State	38	29	8	25,556	88
Local	2	1	0	20	**
Private	28	26	0	3,215	11
Zone 4 totals	69	57	8	28,970	8*
ZONE 5					
Federal	1	0	1	3,200	4
State	27	22	3	71,863	88
Local	14	9	3	4,560	5
Private	31	30	0	2,126	3
Zone 5 totals	73	61	7	81,749	22*
BASIN					
Federal	4	3	1	23,392	6
State	143	100	37	314,534	86
Local	36	20	8	12,868	4
Private	175	159	0	14,748	4
Basin totals	358	282	46	365,542	100

* Percent of Basin Total. ** Less than one-half of one percent.

Source: Appendix C and Table No. A-4 and Table No. A-5.

Table No. A-4

PRIVATE CAMPGROUNDS

LAKE ONTARIO BASIN

Zone	No. of Campgrounds	Size (acres)	Approximate Total Capacity (sites)	No. with Water Dependent Activities
1	28	3,812	2,095	22
2	36	2,318	1,723	30
3	7	1,185	363	6
4	19	2,123	829	18
5	21	1,444	1,472	21
Basin	111	10,882	6,482	97

Sources: 6, 7, 9, 62, 71, 72.

Table No. A-5

PRIVATE GROUP CAMPS*

LAKE ONTARIO BASIN

Zone	No. of Group Camps	Size* (acres)	Approximate Total Capacity (persons)	No. with Water Dependent Activities
1	9	358	893	9
2	28	1,316	3,290	26
3	8	418	1,045	8
4	6	282	704	6
5	9	602	1,503	9
Basin	60	2,976	7,435	58

*Note: Since acreage figures were not always available in the computation phase, it was assumed that the size of average area (in acres) is 40 percent of the capacity for all group camps. This percentage value was derived from a sample of several group camps in which the acreages and capacities were known.

Sources: 4, 5, 62, 97.

Table No. A-6

PUBLIC BOATING FACILITIES
LAKE ONTARIO BASIN

A. Recreational Harbors

Map No.	Name	Estimate Number of Boats Based
1	Wilson Harbor	350
2	Olcott Harbor	100
3	Golden Hills Harbor	40
4	Oak Orchard Harbor	200
5	Braddock Bay Harbor	500
6	Rochester Harbor	1,000
7	Irondequoit Bay Harbor	1,500
8	Pultneyville Harbor	65
9	Great Sodus Bay Harbor	600
10	Port Bay Harbor	250
11	Little Sodus Bay Harbor	400
12	Oswego Harbor	100
13	Sackets Harbor	100
14	Cape Vincent Harbor	200
15	Morristown Harbor	Unknown
16	Ogdensburg Harbor	Unknown

Source: 148, 149

B. Boat Launching Sites

Map No.	Name
1	Four Mile Ck Annex State Park
2	Golden Hills State Park
3	Lakeside Beach State Park
4	Braddock Bay State Park
5	Cuba State Park
6	Conesus Lake B/L Site
7	Honeoye Lake B/L Site
8	Canandaigua Lake B/L Site
9	Keuka Lake B/L Site
10	Seneca Lake State Park
11	Waterloo B/L Site
12	Cayuga Lake State Park
13	Sampson State Park
14	Lodi B/L Site
15	Seneca Lake B/L Site
16	Taughannock Falls State Park
17	Howland Island GMA
18	Cayuga Lake B/L Site
19	Owasco Lake B/L Site-No.
20	Owasco Lake B/L Site-So.
21	Wayne County Wetlands
22	Fair Haven Beach State Park
23	Dryden Lake MUA
24	Skaneateles Lake B/L Site-No.
25	Skaneateles Lake B/L Site-So.
26	Coles Creek Camping Area
27	South Shore B/L Site
28	Three Rivers B/L Site
29	Godfrey's Point B/L Site
30	Oswego SRA
31	Mexico Point B/L Site
32	Henderson Harbor B/L Site
33	Westcott Beach State Park
34	Long Point State Park
35	Stony Creek B/L Site
36	Burnham Point State Park
37	Cedar Point State Park
38	Perch River Wetlands
39	Canoe Picnic Point State Park
40	Wellesley Island State Park
41	Grass Point State Park
42	DeWolf Point State Park
43	Mary Island State Park
44	Keewaydin State Park
45	Kring Point State Park
46	Payne Lake B/L Site
47	Cedar Island State Park
48	Black Lake B/L Site
49	Jacques Cartier State Park
50	Wilson Hill B/L Site
51	Robert Moses State Park
52	Cranberry B/L Site
53	Tupper Lake B/L Site
54	Raquette River B/L Site
55	Forked Lake Campsite
56	Perch River B/L Site
57	Muskellunge Creek B/L Site
58	Black River B/L Site
59	Whetstone Gulf Campsite
60	Stillwater Reservoir B/L Site
61	Fourth Lake Campsite
62	Onondaga Lake County Park
63	Oxbow County Park
64	Wide Waters County Park
65	Genesee Valley County Park

Sources: 78,79, 82, 204, Appendix C.

Table No. A-7

FARM PONDS

LAKE ONTARIO BASIN

COUNTY	Approximate No. of Ponds	Approximate Water Surface (Acres)
Allegany	870	520
Cayuga	430	110
Chemung	20	5
Cortland	10	5
Essex	--	--
Franklin	--	--
Genesee	310	155
Hamilton	--	--
Herkimer	--	--
Jefferson	60	50
Lewis	215	105
Livingston	485	240
Madison	360	575
Monroe	240	120
Niagara	210	105
Oneida	505	250
Onondaga	245	60
Ontario	595	300
Orleans	425	210
Oswego	535	110
Potter (PA)	27	14
St. Lawrence	225	80
Schuyler	250	65
Seneca	400	140
Steuben	90	45
Tompkins	260	105
Wayne	390	120
Wyoming	235	120
Yates	515	260
Total	7,907	3,869

Sources: 143, 144.

Table No. A-8

CANOE TRAILS

LAKE ONTARIO BASIN

Map No.	Name	Approx. No. of Canoeable Miles*
1	Niagara River	8
2	Genesee River	153
3	Fall Creek	11
4	East Branch Fish Creek	28
5	Salmon River	19
6	St. Lawrence River	146
7	Indian River and Black Lake	65
8	Oswegatchie River	154
9	Grass River	72
10	Raquette River**	189
11	Black River	51
12	Oswegatchie River, West Branch	23
13	Moose River	13
14	South Branch Moose River	28
	Total	960

* Mileages given in Column 3 were taken principally from Burmeister's publication.

** Includes Fulton Chain of Lakes, Blue Mountain Lake, Long Lake, and Tupper Lake canoe trails.

Sources: 11, 41.

Table No. A-9

NEW YORK STATE PUBLIC SKI CENTERS

LAKE ONTARIO BASIN

Map No.	Name	Number of Slopes	Trails	Lifts	Tows
1	St. Lawrence U. Snow Bowl	3	3	1	1
2	Big Tupper	0	8	2	0
3	Juniper Hills	2	0	1	0
4	Dry Hill	3	1	1	3
5	Old Forge (Maple Ridge)	1	0	1	0
6	Old Forge (McCauley Mt.)	2	4	2	2
7	Snow Ridge	6	5	5	0
8	Hemlock Ridge	1	2	0	1
9	Mystic Mountain	3	7	2	0
10	Toggenburg	5	3	3	0
11	Ninety Acres	2	0	0	2
12	Drumlins	2	0	1	3
13	Fillmore	1	2	0	1
14	Brantling	4	0	1	6
15	Bristol Mountain	3	4	4	0
16	Frost Ridge	3	3	0	3
17	Swain	6	17	4	0
	Totals	47	59	28	22

Source: 74.

Appendix B

Section Page

A. Methodology For Estimating Demand For Recreational Opportunities In The Lake Ontario Basin B-1

1. Market Area Demand B-1

2. Vacation Demand B-1

3. Future Demand B-3

4. Zones Demands B-3

B. Methodology For Estimating The Present Acreage Development Of Recreational Lands B-6

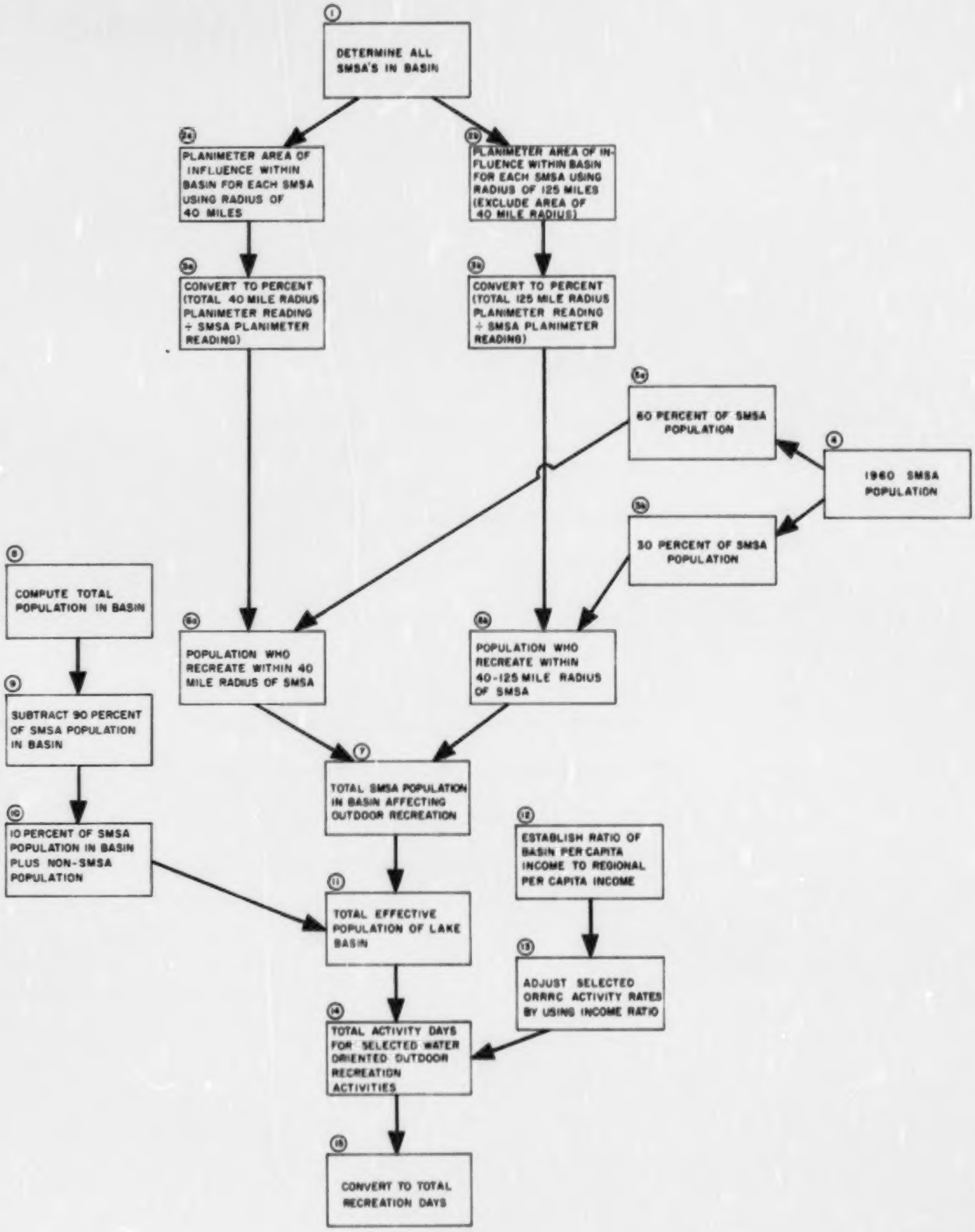
C. Methodology For Estimating Acreage Needs B-7

1. Determining Present Resource Requirements B-7

2. Determining Future Resource Requirements B-8

Plate No. B-1

MARKET AREA DEMAND FLOWCHART



1
DETERMINE ALL SMSA'S IN BASIN
2a
PLANIMETER AREA OF INFLUENCE WITHIN BASIN FOR EACH SMSA USING RADIUS OF 40 MILES
2b
PLANIMETER AREA OF INFLUENCE WITHIN BASIN FOR EACH SMSA USING RADIUS OF 125 MILES (EXCLUDE AREA OF 40 MILE RADIUS)
3a
CONVERT TO PERCENT (TOTAL 40 MILE RADIUS PLANIMETER READING ÷ SMSA PLANIMETER READING)
3b
CONVERT TO PERCENT (TOTAL 125 MILE RADIUS PLANIMETER READING ÷ SMSA PLANIMETER READING)
5a
60 PERCENT OF SMSA POPULATION
4
1960 SMSA POPULATION
5b
30 PERCENT OF SMSA POPULATION
8
COMPUTE TOTAL POPULATION IN BASIN
6a
POPULATION WHO RECREATE WITHIN 40 MILE RADIUS OF SMSA
6b
POPULATION WHO RECREATE WITHIN 40-125 MILE RADIUS OF SMSA
9
SUBTRACT 90 PERCENT OF SMSA POPULATION IN BASIN
7
TOTAL SMSA POPULATION IN BASIN AFFECTING OUTDOOR RECREATION
10
10 PERCENT OF SMSA POPULATION IN BASIN PLUS NON-SMSA POPULATION
12
ESTABLISH RATIO OF BASIN PER CAPITA INCOME TO REGIONAL PER CAPITA INCOME
11
TOTAL EFFECTIVE POPULATION OF LAKE BASIN
13
ADJUST SELECTED ORRRC ACTIVITY RATES BY USING INCOME RATIO
14
TOTAL ACTIVITY DAYS FOR SELECTED WATER ORIENTED OUTDOOR RECREATION ACTIVITIES
15
CONVERT TO TOTAL RECREATION DAYS

METHODOLOGY FOR ESTIMATING DEMAND FOR RECREATIONAL OPPORTUNITIES IN THE LAKE ONTARIO BASIN

Market Area Demand. The first step in determining the present recreation demand for the modified market area involved calculation of the population on which to base estimates. The 1960 population of all SMSA's inside the basin, as well as those within 125 miles of the basin, were determined.

From information contained in the "California Public Outdoor Recreation Plan" (12), ORRRC Report No. 4 (108), and the "Report on the Comprehensive Survey of the Water Resources of the Delaware River Basin" (195), it was concluded that:

a. Sixty percent of all recreation activity occurs within 40 miles of the participant's home.

b. Another thirty percent occurs between 40 and 125 miles of the participant's home.

c. Ten percent of all use occurs at distances greater than 125 miles.

It was also assumed that 60 percent of the population of each SMSA will recreate within a 40 mile radius from the center of the SMSA. These participants constituted the "day use sector." Likewise, 30 percent of the population of each SMSA was assumed to recreate between 40 and 125 miles from the center of the SMSA. This group of participants is termed "overnight or weekend sector." Reference is made to the flow chart on the opposite page which shows the sequential steps in deriving the modified market area demand for the day and weekend sectors. Results of this procedure are tabulated in Table No. B-1.

Vacation Demand. The following procedure yields an estimate of the number of people who spend their vacations in the basin. Unpublished source material was provided by the Travel Bureau, New York Department of Commerce (76).

Step 1. Grand total recreation - tourist attendance (Schedule I of 76a) is obtained for the basin by multiplying the grand total recreation-tourist attendance for each county times the percent of the county in the basin. Result: 12,944,325 tourists.

Step 2. To obtain a percent value of the basin's attendance to that of the entire state: 12,944,325 ÷ 115,057,435 = 11.2%

Table No. B-1

DEMAND FOR SELECTED WATER-ORIENTED OUTDOOR RECREATIONAL ACTIVITIES
LAKE ONTARIO BASIN, 1960
(Day and Overnight or Weekend Sectors)

Activity	Adjusted Annual Participation Rate	Adjusted Summer Participation Rate	Annual Activity Occasions (thousands)	Summer Activity Occasions (thousands)
Water-dependent				
Swimming	8.13	6.96	16,952	14,512
Fishing	3.33	1.80	3,200*	1,730*
Boating	1.81	1.41	3,774	2,940
Water-Skiing	.33	.30	688	626
Canoeing	.13	.09	271	188
Sailing	.17	.06	354	125
Subtotal	13.90	10.62	25,239	20,121
Water-enhanced				
Camping	.56	.34	1,168	709
Picnicking	3.85	2.87	8,028	5,984
Sightseeing	5.21	2.04	10,863	4,254
Nature Walks	2.85	1.16	5,942	2,419
Hunting	1.38	.22	1,500*	239*
Hiking	.42	.29	876	605
Subtotal	14.27	6.92	28,377	14,210
Winter Sports				
Skiing	.18	—	375	—
Ice Skating	1.09	—	2,273	—
Sledding	1.20	—	2,502	—
Subtotal	2.47	—	5,150	—
TOTAL	30.64	17.54	58,766	34,331

* Based on information obtained from Bureau of Sport Fisheries and Wildlife

Step 3. According to information released by the National Association of Travel Organizations in 1965, tourism is a three billion dollar industry in New York State (24). On an average vacation, the tourist spends $63.00 per trip to New York (76b). An estimate of tourists coming to New York State yields: $3,000,000,000 ÷ $63 = 47,619,047 tourists.

Step 4. Schedule I of Source 76 indicates 34.4 percent (plus an unknown element) of the attendance distribution preferred to pursue outdoor recreational activities. A recent report completed by the Michigan Highway Department (55) shows that 50 percent of the respondents mentioned outdoor recreation as a main purpose for their stay in Michigan. To account for the undetermined quantity cited above, one-half the difference of 50 percent and 34.4 percent is taken as an estimate of the proportion of tourists who come to New York and recreate in the out-of-doors. Result: 42.2 percent.

Step 5. To determine the number of tourists who come to New York State for the main purpose of pursuing outdoor recreation. 47,619,047 x 42.2 percent = 20,095,238 tourists.

Step 6. To acquire an estimate for the basin, multiply the tourists figure in Step 5 times the percentage value in Step 2: 20,095,238 x 11.2% = 2,250,667 tourists.

Step 7. Thus, to obtain the number of recreation days in the basin, multiply the number of tourists found in Step 6 by 6.4 which is the average number of days a vacationist spends in New York State. Result: 2,250,667 x 6.4 = 14,404,269 recreation days. This value is used in Table No. B-2 to compute the present vacation demand for selected activities in the Lake Ontario Basin.

Future Demand. Table No. B-3 on page B-5 shows future estimated participation in selected summer activities.

Zone Demands. In order to determine the recreation demand for each of the five zones, it was necessary to compute the resident demand and the vacation demand separately. For the resident demand, the total annual participation rate for the basin (Table No. B-1) was adjusted by an income index computed for each of the five subbasins. This income index is a zone-basin ratio of per capita income. Zone population estimates were multiplied by the adjusted annual participation rates for each of the zones to yield activity occasions. Since the resident basin demand figure was previously determined, each zone total is expressed as a percent of the total basin.

Distribution of seasonal vacation homes and attendance at state parks were used as indicators to gauge the zonal allocation for the vacation demand. Both of these factors were given equal weight in obtaining the percent of predetermined vacation activity occasions found in Table No. B-2 of this Appendix.

Table No. B-2

DEMAND FOR SELECTED WATER-ORIENTED OUTDOOR RECREATIONAL ACTIVITIES
LAKE ONTARIO BASIN, 1960
(Vacation Sector)

Activity	Percent who engaged in outdoor activities on vacation trips	Column 2 x 14,404,269* activity occasions (1,000's)
(a) Sightseeing	53	7,634
(b) Swimming	38	5,474
(c) Fishing	27	3,889
(d) Picnicking	29	4,177
(e) Boating & Canoeing	19	2,737
(f) Hiking	14	2,017
(g) Camping	10	1,440
(h) Hunting	4	576
(i) Nature Walks	6	864
(j) Horseback riding	3	432
(k) Skiing & Winter Sports	1	144
(l) Took trip but did not engage in outdoor activities	22	3,169
Totals	226**	28,952***

* See result in Step 7.

** Totals to more than 100 because vacationists participate in more than one activity per day.

*** Total does not include activities (j) and (l).

Note: This analysis assumes that those enjoying their vacations while in the basin participated in approximately two activities on the average per day.

Source: ORRRC Study Report No. 20, Table 50, Page 50.

Table No. B-3

EXPECTED SUMMER (JUNE, JULY, AUGUST) PARTICIPATION IN SELECTED WATER-ORIENTED ACTIVITIES IN 2000 and 2020
LAKE ONTARIO BASIN

Activity	1960 Summer Activity Occasions (1,000's) 1/	2000 Summer Activity Occasions (1,000's)2/		2020 Summer Activity Occasions (1,000's) 3/	
		Without Opportunity	With Opportunity	Without Opportunity	With Opportunity
Water-Dependent					
Swimming	14,512	49,776	58,048	67,408	79,816
Fishing 4/	1,730	2,883	2,883	3,460	3,460
Boating	2,940	10,290	12,260	13,965	16,920
Water Skiing	626	3,030	3,606	4,232	5,596
Canoeing 5/	188	658	784	893	1,082
Sailing 5/	125	438	521	594	719
Subtotal	20,121	67,075	78,102	90,552	107,593
Water-Enhanced					
Camping	709	2,786	4,573	3,824	6,505
Picnicking	5,984	14,960	18,491	19,448	24,744
Sightseeing	4,254	12,209	20,164	16,186	28,119
Nature Walks	2,419	6,507	6,507	8,551	8,551
Hiking	605	2,232	3,697	3,045	5,243
Hunting 4/	239	398	398	478	478
Subtotal	14,210	39,092	53,830	51,532	73,640
Total	34,331	106,167	131,932	143,084	181,233

1/ From Column 5, Table No. B-1.
2/ Projections based on data contained in Table No. 6, ORRRC Report 26.
3/ 2020 figures obtained by straight line equation.
4/ Based on information obtained from Bureau of Sport Fisheries and Wildlife.
5/ Assumes same projection as "Boating."

METHODOLOGY FOR ESTIMATING ACREAGE NEEDS

The problem of adequately serving the recreational needs of the public comes into sharp focus if developed acreages are dealt with rather than total public recreational acres. Table No. B-4 provides estimates of the basin's present developed acreages by zone. In compiling data for this table, it was assumed that existing public recreation areas, except those which have been newly established, have been developed to the optimum level. From Clawson's classification of recreation lands (11), optimum development for user-oriented areas is considered to be 70 percent and that for intermediate areas is 15 percent.

Table No. B-4

EXISTING DEVELOPED ACREAGES
(Estimates in acres with adjustments)*

Zones	Federal	State	Local	Private	Zone Total
1	none	3,007	1,171	4,170	8,348
2	400	3,646	2,060	3,634	9,740
3	none	318	none	1,603	1,921
4	27	1,786	14	2,405	4,232
5	none	4,378	2,862	2,046	9,286
Basin Total	427	13,135	6,107	13,858	33,527

* Adjustments in acreages provided by Sources Appendix C, Table No. A-4, and Table No. A-5 were made as follows:

a. Federal - estimated total present development in the three developed areas.

b. State - adjusted to 15 percent level of development except for highly developed state parks (70 percent used) and boat launching sites (100 percent used).

c. Local - adjusted to 70 percent level of development.

d. Private - assumed 100 percent of development at existing privately owned facilities open to general public.

Undeveloped and/or newly acquired lands were not tabulated.

METHODOLOGY FOR ESTIMATING THE PRESENT ACREAGE DEVELOPMENT OF RECREATIONAL LANDS

Determining Present Resource Requirements. This method is based on land area per person as determined by personnel in the Lake Central Regional Office, Bureau of Outdoor Recreation. These standards were arrived at by compilation of existing information from many sources. They are not to be considered as official Bureau standards.

As stated on Page 5-2 of Chapter 5, the acreage needs are determined in order to support anticipated visitation on those days when maximum use occurs. This was determined as follows:

14 week summer season = 98 days
28 weekend days plus 2 holidays = 30 days
Weekdays = 68 days

Assume three weekdays of use equals one weekend day of use.
23 + 30 = 53 capacity days.

For the activity of swimming, which is curtailed by inclement weather, assume 80 percent of capacity days will be suitable. Therefore, assumed 42 capacity days for swimming.

Land area per person standards as presented below include all development necessary to support one person engaging in the respective activity. The activities of swimming, fishing, boating, picnicking, and camping are considered, since these constitute the more popular, basic activities that should be provided for wherever possible.

Boating

Assume:
1. 3 people/car and boat
2. 1,633 sq ft parking/car and trailer incl ramp facility
3. Turnover factor of 2

Camping

Assume:
1. 5 people/party
2. 8 campsite units/acre
3. Turnover factor of 1.0

Swimming

Assume:
1. 4 people/car
2. 48 cars parking/acre (910 sq ft/ car of 227 sq ft/ person)
3. 75 sq ft beach/person
4. Turnover factor of 1.5

Picnicking

Assume:
1. 4 people/car
2. 10 picnic tables/acre, including parking
3. Turnover factor of 1.5

Fishing

Assume:
1. 2 people/car and boat
2. 1,633 sq ft parking/car and trailer incl ramp facility
3. Turnover factor of 1.5

This information is then applied to the formula below to arrive at the necessary acreage requirements for each activity.

$$AR = \frac{D \times a}{CD \times TF \times 43{,}560}$$

Where: AR = acreage requirement
D = demand for respective activity in summer activity occasions
a = area per person in square feet for respective facilities
CD = capacity days
TF = turnover factor
43,560 = square feet per acre

The sum of the five acreage requirements yield the developed acreage necessary for the provision of adequate opportunity for these basic activities. This total is considered as the minimum acceptable amount of developed land to be provided in the basin (or zone). From this zone requirements figure, the existing developed acreages were subtracted which left the amount of developed land still needed (appropriately) labeled "deficit").

In order to compute the additional acreage needed, the developed acreage deficit figures (appearing in Column 4 of Table No. 5-1) were multiplied by 1.6. The following procedure illustrates how the 1.6 multiplier was derived:

User-oriented areas = 70% level of development
Intermediate areas = 15% level of development
Mean average = 42.5% level of development for all developed lands assuming that one-half of total lands needed for development will be used as user-oriented and one-half as intermediate.

Since average developed lands constitute about 40% of the total recreational land area, the balance or 60% is allocated to extensive type recreation activities, buffer zones, and undeveloped areas--thereby yielding a factor of 1.6 (or 160%) when establishing an additional deficit.

Determining Future Resource Requirements. Except for the demand figures, the same factors employed in the present resource requirements determination were used in the future resource requirements computation. In lieu of the present demand figures, the 2000 and 2020 "with" opportunity demand figures were utilized in the future requirements calculations. The results are shown in Table No. 5-2 in Chapter 5.

Appendix C

Inventory of Existing Recreation Areas in Lake Ontario Basin

Sources: 61, 72, 76a, 100, 181, 204

FEDERAL - STATE

SITE NO.	NAME	COUNTY	ADJACENT WATER	AREA (acres)	WATER DEPENDENT	SWIMMING	BOATING	FISHING	PICNICKING	TENT CAMPING	TRAILER CAMPING	GROUP CAMPING	1965 VISITATION
	ZONE 1												
S-1	Carlton Hill MUA	Wyoming	Oakta Creek	1,920									(Undeveloped)
S-2	Silver Lake GMA	Wyoming	Genesee R. Trib.	10									(Undeveloped)
S-3	Silver Lake St. Pk.	Wyoming	Genesee R. Trib.	484	X			X	X				5,500
S-4	Letchworth St. Pk.	Livingston	Genesee R.	14,021	X	X		X	X	X	X		654,000
S-5	Conesus L. B/L Site	Livingston	Conesus L.	3	X		X	X					n/a
S-6	Honeoye L. B/L Site	Ontario	Honeoye L. Trib.	4	X		X	X					n/a
S-7	Harriet Spencer MUA	Ontario	Honeoye L. Trib.	678									(Undeveloped)
S-8	Rattle Snake Hill GMA	Livingston	Genesse R.	5,118					X			X	n/a
S-9	Livingston SRA	Livingston	Conesus L. - Canaseraga Cr. T.	2,590									(Undeveloped)
S-10	Stony Brook St. Pk.	Steuben	Canaseraga Cr. Trib.	554	X	X			X	X	X	X	136,252
S-11	Cuba St. Pk.	Allegany	Black Cr.	650	X	X	X	X	X				67,500
S-12	Hanging Bog GMA	Allegany	Black Cr.	4,290	X			X	X				n/a
	ZONE 2												
F-1	Montezuma Nat. Wildlife Area	Seneca	Clyde R.	6,776	X			X					n/a
F-2	Hector Land Use Area	Seneca and Schuyler	Oswego River Basin	13,237	X			X		X	X		25,000
S-13	Stid Hill MUA	Ontario	Canandaigua L. Trib.	731									(Undeveloped)
S-14	South Hill MUA	Yates	West R. Canandaigua L. Trib.	848									(Undeveloped)
S-15	Naples Cr. GMA	Ontario	Canandaigua L. Trib.	57	X			X					n/a
S-16	High Tor GMA	Yates	Canandaigua L. Trib.	4,106	X			X	X			X	n/a
S-17	Ontario SRA	Ontario	Canandaigua L. Trib.	677									(Undeveloped)
S-18	Canandaigua L. B/L Site	Ontario	Canandaigua L. Trib.	4	X		X	X					n/a
S-19	Keuka L. B/L Site	Yates	Keuka L. Trib.	1	X		X	X					n/a
S-20	Keuka L. St. Pk.	Yates	Keuka L. Trib.	620	X			X	X				9,848
S-21	Yates SRA	Yates	Keuka L. Trib.	1,900									(Undeveloped)
S-22	Seneca L. St. Pk.	Seneca	Seneca L.	265	X	X	X	X	X				89,731
S-23	Waterloo B/L Site	Seneca	Cayuga and Seneca Canal	2	X		X	X					n/a
S-24	Sampson St. Pk.	Seneca	Seneca L.	1,737	X	X	X	X	X	X			36,658
S-25	Willard St. GMA	Seneca	Seneca L. Trib.	158									(Undeveloped)
S-26	Lodi Point B/L Site	Seneca	Seneca L.	10	X		X	X					n/a
S-27	Watkins Glen St. Pk.	Schuyler	Seneca L. Trib.	605	X	X			X	X	X	X	486,763
S-28	Seneca L. B/L Site	Schuyler	Seneca L. Trib.	9	X		X	X					n/a
S-29	Schuyler SRA	Schuyler	Seneca L. Trib.	16,532									(Undeveloped)
S-30	Cayuga L. St. Pk.	Seneca	Cayuga L.	236	X	X	X	X	X	X	X		218,759
S-31	Mud Lock B/L Site	Cayuga	Cayuga L.	4	X			X					n/a
S-32	Howland Island GMA	Cayuga	Seneca R. Trib.	3,218	X		X					X	n/a
S-33	Canal Wetlands	Cayuga	Barge Canal	1,361									(Undeveloped)
S-34	Cayuga L. B/L Site	Cayuga	Seneca L. Trib.	5	X		X	X					n/a
S-35	Long Point MUA	Cayuga	Cayuga L.	98									(Undeveloped)
S-36	Owasco L. B/L Site - North	Cayuga	Owasco L. Trib.	1	X		X	X					n/a
S-37	Owasco L. B/L Site - South	Cayuga	Owasco L. Trib.	10	X		X	X					n/a
S-38	Cayuga SRA	Cayuga	Owasco L. Trib.	8,403									(Undeveloped)
S-39	Fillmore Glen St. Pk.	Cayuga	Owasco L. Trib.	857	X	X			X	X	X		62,358
S-40	Taughannock Falls St. Pk.	Tompkins	Cayuga L. Trib.	675	X	X	X	X	X	X	X		240,980

FEDERAL - STATE

SITE NO.	NAME	COUNTY	ADJACENT WATER	AREA (acres)	WATER DEPENDENT	SWIMMING	BOATING	FISHING	PICNICKING	TENT CAMPING	TRAILER CAMPING	GROUP CAMPING	1965 VISITATION
	ZONE 2 (Con.)												
S-41	Buttermilk Falls St. Pk.	Tompkins	Buttermilk Cr.	675	X	X		X	X	X			84,208
S-42	Robert H. Treman St. Pk.	Tompkins	5 Mile Cr.	1,020	X	X		X	X	X	X		150,250
S-43	Connecticut Hill GMA	Tompkins	Cayuga L. Trib.	11,610									(Undeveloped)
S-44	Dryden L. MUA	Tompkins	Fall Cr.	196	X		X	X	X				n/a
S-45	Tompkins SRA	Tompkins	6 Mile Cr.	18,810									(Undeveloped)
S-46	Battle Island St. Pk.	Oswego	Oswego R. Trib.	235									37,691
S-47	Curtis GMA	Oswego	Oswego R. Trib.	45	X			X					n/a
S-48	Three Mile Bay Wetlands	Oswego	Oneida L. Trib.	1,642									(Undeveloped)
S-49	Cross L. Islands GMA	Cayuga	Seneca R.	28									(Undeveloped)
S-50	Mudlake Wetlands	Onondaga	Seneca R.	326									(Undeveloped)
S-51	Three Rivers GMA	Onondaga	Oswego R. Trib.	3,496	X			X	X			X	n/a
S-52	Three Rivers B/L Site	Onondaga	Oneida R. Trib.	18	X		X	X					n/a
S-53	South Shore B/L Site	Onondaga	Oneida L.	11	X		X	X					n/a
S-54	Godfrey's Pt. B/L Site	Oneida	Oneida L.	11	X		X	X					n/a
S-55	Verona Beach St. Pk.	Oneida	Oneida L.	1,355	X	X		X	X				179,380
S-56	Cicero Swamp Wetlands	Onondaga	Oneida L. Trib.	3,724									(Undeveloped)
S-57	Onondaga SRA	Onondaga	Onondaga L. Trib.	2,146									(Undeveloped)
S-58	Green Lakes St. Pk.	Onondaga	Oneida L. Trib.	925	X	X	X	X	X	X	X		508,368
S-59	Clark Reservation St. Pk.	Onondaga	Butternut Cr.	228	X			X	X				40,538
S-60	Skaneateles B/L Site-North	Onondaga	Skaneateles L.	2	X		X	X					n/a
S-61	Skaneateles B/L Site - South	Cortland	Skaneateles L.	8	X		X	X					n/a
S-62	Chittenango Falls St. Pk.	Madison	Chittenango Cr.	123	X			X	X	X			70,600
S-63	Madison SRA	Madison	Chittenango Cr.	22,302									(Undeveloped)
	ZONE 3												
S-64	Black R. B/L Site	Lewis	Black R.	2	X		X	X					n/a
S-65	Lewis SRA	Lewis	Deer R. Trib.	80,284	X			X					n/a
S-66	Tug Hill GMA	Lewis	Mad R.	4,985									(Undeveloped)
S-67	Whetstone Gulf Campsite	Lewis	Black R. Trib.	n/a	X	X	X			X	X		24,751
S-68	Chases L. Campsite	Lewis	Black R. Trib.	n/a									(Undeveloped)
S-69	Stillwater Res. B/L Site	Herkimer	Beaver R.	1	X		X	X					n/a
S-70	Cascade L. Campsite	Herkimer	Stillwater Res.	n/a									(Undeveloped)
S-71	Nelson L. Campsite	Herkimer	Nelson L.	n/a									(Undeveloped)
S-72	Nicks L. Campsite	Herkimer	Nicks L.	n/a					X	X			n/a
S-73	Treasure Island Campsite	Herkimer	Black R. Trib.	n/a									(Undeveloped)
S-74	Fourth Lake Campsite	Herkimer	Black R. Trib.	n/a	X		X	X	X	X			2,839
S-75	Limekiln L. Campsite	Hamilton	Black R. Trib.	n/a	X	X		X	X	X			24,092
S-76	Eighth Lake Campsite	Hamilton	Raquette R. Trib.	n/a	X	X		X	X	X	X		16,144
	ZONE 4												
S-77	Burnham Point St. Pk.	Jefferson	St. Lawrence R.	12	X	X	X	X	X	X	X		16,252
S-78	Cedar Point St. Pk.	Jefferson	St. Lawrence R.	48	X	X	X	X	X	X	X		82,506
S-79	French Creek Wetlands	Jefferson	St. Lawrence R. Trib.	568									(Undeveloped)

FEDERAL - STATE

SITE NO.	NAME	COUNTY	ADJACENT WATER	AREA (acres)	WATER DEPENDENT	SWIMMING	BOATING	FISHING	PICNICKING	TENT CAMPING	TRAILER CAMPING	GROUP CAMPING	
	ZONE 4 (Con.)												
F-3	Thousands Island Camp Annex	Jefferson	St. Lawrence R.	179	X		X	X		X	X		13,926
S-80	Canoe Picnic Point St. Pk.	Jefferson	St. Lawrence R.	70	X	X	X	X	X	X			11,531
S-81	Wellesley Island St. Pk.	Jefferson	St. Lawrence R.	2,636	X	X	X	X	X	X	X		176,481
S-82	Grass Point St. Pk.	Jefferson	St. Lawrence R.	27	X	X	X	X	X	X	X		55,686
S-83	DeWolf Point St. Pk.	Jefferson	St. Lawrence R.	13	X		X	X	X	X	X		7,056
S-84	Mary Island St. Pk.	Jefferson	St. Lawrence R.	13	X	X	X	X	X	X			5,664
S-85	Keewaydin St. Pk.	Jefferson	St. Lawrence R.	179	X		X	X		X			10,611
S-86	Kring Point St. Pk.	Jefferson	St. Lawrence R.	41	X	X	X	X	X	X	X		51,205
S-87	Cedar Island St. Pk.	St. Lawrence	St. Lawrence R.	10	X	X	X	X	X	X			2,740
S-88	Indian R. Wetlands	Jefferson	Indian R.	737	X			X					n/a
S-89	Payne L. B/L Site	Jefferson	Indian R.	1	X		X	X					n/a
S-90	L. Bonapart Campsite	Lewis	L. Bonapart	n/a									(Undeveloped)
S-91	Jacques Cartier St. Pk.	St. Lawrence	St. Lawrence R.	461	X	X	X	X	X	X	X		71,297
S-92	Black L. B/L Site	St. Lawrence	Oswegatchie R.	3	X		X	X					n/a
S-93	Fish Cr. Wetlands	St. Lawrence	St. Lawrence R.	506									(Undeveloped)
S-94	Eel Weir Campsite	St. Lawrence	Oswegatchie R.	n/a					X	X			8,775
S-95	Wilson Hill GMA	St. Lawrence	St. Lawrence R.	3,415									(Undeveloped)
S-96	Wilson Hill B/L Site	St. Lawrence	St. Lawrence R.	8	X		X	X					n/a
S-97	Robert Moses St. Pk.	St. Lawrence	St. Lawrence R.	3,115	X	X	X	X	X	X	X		184,395
S-97A	Coles Creek Camping Area	St. Lawrence	St. Lawrence River	n/a	X	X	X	X	X	X			n/a
S-98	Upper and Lower Lakes Wetlands	St. Lawrence	Oswegatchie R. Trib.	7,110	X			X					n/a
S-99	Higley Flow Campsite	St. Lawrence	Raquette R.	n/a									(Undeveloped)
S-100	Horseshore L. Campsite	St. Lawrence	Grass R.	n/a									(Undeveloped)
S-101	St. Lawrence SRA	St. Lawrence	Oswegatchie R.	61,925	X	X							n/a
S-102	Cranberry B/L Site	St. Lawrence	Cranberry L.	3	X		X	X					n/a
S-103	Cranberry L. Campsite	St. Lawrence	Cranberry L.	n/a	X	X			X	X			17,037
S-104	Tupper L. B/L Site	Franklin	Raquette R. Trib.	2	X		X	X					n/a
S-105	Raquette R. B/L Site	Ranklin	Raquette R. Trib.	1	X		X	X					n/a
S-106	Long L. Campsite	Hamilton	Long L.	n/a									(Undeveloped)
S-107	L. Eaton Campsite	Hamilton	L. Eaton	n/a	X	X			X	X			18,992
S-108	South Pond Campsite	Hamilton	Raquette R. Trib.	n/a									(Undeveloped)
S-109	Forked L. Campsite	Hamilton	Raquette R. Trib.	n/a	X		X	X	X	X			8,430
S-110	Golden Beach Campsite	Hamilton	Raquette R. Trib.	n/a	X	X			X	X	X		27,610
S-111	Brown Tract Pond Campsite	Hamilton	Raquette R. Trib.	n/a	X	X			X	X			7,684
	ZONE 5												
F-4	Oak Orchard Nat. Wildlife Refuge	Orleans and Genesee	Small St. Trib.	3,200									(Undeveloped)
S-112	Reservoir St. Pk.	Niagara	Niagara R.	134					X				38,300
S-113	Lewiston St. Pk.	Niagara	Niagara R.	119									(Undeveloped)
S-114	Lower Niagara St. Pk.	Niagara	Niagara R.	260					X				17,400
S-115	Fort Niagara St. Pk.	Niagara	Niagara R.-L. Ontario	284	X			X	X				341,280
S-116	Four Mile Cr. Annex St. Pk.	Niagara	L. Ontario	248	X	X	X	X		X	X		59,840
S-117	Wilson Tuscarora St. Pk.	Niagara	Fish Cr.	311									(Undeveloped)
S-118	Golden Hills St. Pk.	Niagara	L. Ontario	378	X	X	X	X		X	X		6,358

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SITE NO.	NAME	COUNTY	ADJACENT WATER	AREA (acres)	WATER DEPENDENT	SWIMMING	BOATING	FISHING	PICNICKING	TENT CAMPING	TRAILER CAMPING	GROUP CAMPING	
	ZONE 5 (Con.)												
S-119	Lake Side Beach St. Pk.	Orleans	L. Ontario	642	X		X	X					1,500
S-120	Oak Orchard Wetlands	Genesee	Small St. Trib.	2,447	X			X	X				n/a
S-121	Hamlin Beach St. Pk.	Monroe	L. Ontario	1,118	X	X		X	X				264,500
S-122	L. Ontario St. Parkway	Monroe	L. Ontario	2,020	X			X					200,000
S-123	Braddock Bay St. Pk.	Monroe	L. Ontario	2,115	X		X	X	X				21,000
S-124	Bushnell Basin MUA	Monroe	Barge Canal	37	X			X					n/a
S-125	Chimney Bluffs St. Pk.	Wayne	L. Ontario Trib.	596	X			X					n/a
S-126	Wayne County Wetlands	Wayne	L. Ontario Trib.	3,758	X	X	X	X	X				n/a
S-127	Fair Haven Beach St. Pk.	Cayuga	L. Ontario	1,096	X	X	X	X	X	X	X		288,983
S-128	Happy Valley GMA	Oswego	Salmon R. Trib.	8,624	X			X					n/a
S-129	Oswego SRA	Oswego	Oneida L. Trib.	20,362	X	X	X	X					n/a
S-130	Mexico Point B/L Site	Oswego	L. Ontario	10	X		X	X					n/a
S-131	Selkirk Shores St. Pk.	Oswego	L. Ontario	980	X	X		X	X	X	X		156,845
S-132	Little John GMA	Oswego	Mad R.	8,021	X			X					n/a
S-133	Jefferson SRA	Jefferson	Sandy Cr. Trib.	16,163	X			X					n/a
S-134	Lake View Marshes Wetlands	Jefferson	L. Ontario	1,755	X			X					n/a
S-135	Southwick Beach St. Pk.	Jefferson	L. Ontario	133	X	X		X	X	X			n/a
S-136	Stony Creek B/L Site	Jefferson	Stony Cr.	6	X		X	X					n/a
S-137	Henderson Harbor B/L Site	Jefferson	L. Ontario	4	X		X	X					n/a
S-138	Westcott Beach St. Pk.	Jefferson	L. Ontario	319	X	X	X	X	X	X	X		160,918
S-139	Sacketts Harbor St. Pk.	Jefferson	L. Ontario	6					X				54,600
S-140	Muskellunge Cr. B/L Site	Jefferson	L. Ontario	9	X		X	X					n/a
S-141	Perch R. B/L Site	Jefferson	L. Ontario	6	X		X	X					n/a
S-142	Long Point St. Pk.	Jefferson	L. Ontario	23	X	X	X	X	X	X	X		15,848
S-143	Perch R. Wetlands	Jefferson	Perch R.	6,733	X		X	X					n/a

LOCAL

SITE NO.	NAME	COUNTY	ADJACENT WATER	AREA (acres)	WATER DEPENDENT	SWIMMING	BOATING	FISHING	PICNICKING	TENT CAMPING	TRAILER CAMPING	GROUP CAMPING	1963 VISITATION
	ZONE 1												
L-1	Seneca Co. Pk.	Monroe	Genesee R.	277	X	X			X				610,000
L-2	Highland Co. Pk.	Monroe	Genesee R.	120					X				250,000
L-3	Churchville Co. Pk.	Monroe	Black Cr.	664	X		X	X	X				850,000
L-4	Genesee Valley Co. Pk.	Monroe	Genesee R.	612	X		X	X	X				900,000
L-5	Oatka Cr. Co. Pk.	Monroe	Oatka Cr.	441									(Undeveloped)
L-6	Genesee Township Pk.	Potter	Genesee R.	10	X			X					n/a
	ZONE 2												
L-7	Ontario Co. Pk.	Ontario	Grimes Cr.	390					X				7,500
L-8	Emerson Pk. Recreation Area	Cayuga	Owasco L. Trib.	80	X	X			X				200,000
L-9	Fort Ontario Pk.	Oswego	L. Ontario	27	X	X	X		X				15,000
L-10	Beaver L. Pk.	Onondaga	Oswego R. Trib.	498									(Undeveloped)
L-11	Oneida Shores Pk.	Onondaga	Oneida L. Trib.	336									(Undeveloped)
L-12	Hopkins Rd. Co. Pk.	Onondaga	Onondaga L.	120									(Undeveloped)
L-13	West Shore Co. Pk.	Onondaga	Onondaga L.	170									(Undeveloped)
L-14	Onondaga L. Co. Pk.	Onondaga	Onondaga L.	430	X		X	X	X				714,000
L-15	Camillus Co. Pk.	Onondaga	Onondaga L. Trib.	36	X	X			X				219,621
L-16	Marcellus Co. Pk.	Onondaga	9 Mile Cr.	57					X				105,000
L-17	Jamesville Beach Co. Pk.	Onondaga	Buttermilk Cr.	121	X	X			X				70,669
L-18	Pratt's Falls Co. Pk.	Onondaga	Buttermilk Cr.	306					X	X			61,258
L-19	Highland Forest Co. Pk.	Onondaga	Limestone Cr.	2,670					X	X		X	29,246
L-20	Oxbow Co. Pk.	Madison	Oneida L. Trib.	923	X	X	X	X	X	X	X	X	n/a
L-21	Wide Waters Co. Pk.	Wayne	Barge Canal	4	X		X		X				
	ZONE 4												
L-22	Little Wolf Beach & Campsite	Franklin	Raquette R. Trib.	5	X	X	X	X	X	X	X		n/a
L-23	Santaway Pk.	Jefferson	Indian R.	15				X	X	X			n/a
	ZONE 5												
L-24	Krull Co. Pk.	Niagara	L. Ontario	77	X	X			X				100,000
L-25	Canal East Co. Pk.	Niagara	Barge Canal	25									(Undeveloped)
L-26	Salmon Cr. Co. Pk.	Monroe	Small Streams Trib.	347									(Undeveloped)
L-27	Ontario Beach	Monroe	L. Ontario	35	X	X			X				610,000
L-28	Durand Eastman Co. Pk.	Monroe	L. Ontario	712	X	X			X				950,000
L-29	Webster Beach Co. Pk.	Monroe	L. Ontario	547	X	X		X	X			X	100,000
L-30	Irondequoit Co. Pk.	Monroe	Ironequoit Bay	101									(Undeveloped)
L-31	Ellison Co. Pk.	Monroe	Small Streams Trib.	376	X			X	X				750,000
L-32	Powder Mills Co. Pk.	Monroe	Small Streams Trib.	301	X	X		X	X			X	400,000
L-33	Mendon Ponds Co. Pk.	Monroe	Small Streams Trib.	1,729	X	X	X	X	X				600,000
L-34	B. Forman Co. Pk.	Wayne	L. Ontario	24	X			X	X				20,000
L-35	Community Park	Oswego	Small Streams Trib.	50					X				n/a
L-36	Washington Picnic	Jefferson	Sandy Cr. Trib.	232					X			X	15,000

Appendix D

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Appendix E

Views of Other Interests

Approximately sixty copies of the preliminary draft of this report were provided to interested Federal, state, and local government agencies for review and/or comment. Review from these agencies is appreciated; many portions of the report were revised to reflect their comments. Copies of their letters have been made a part of this report and are listed by agency in the index on the following page. In some instances comments disagreed with statements made in the preliminary report. Every comment was carefully considered and changes were made. A few items, especially in regard to water quality recreational relationships, were viewed differently by this Bureau. The aim of this report is to investigate and to report the impact of water quality upon recreation in the basin--and to that purpose this Bureau has addressed the study with the ultimate goal of providing optimum water-oriented outdoor recreation opportunities without quality deterioration.

The New York State recreation plan recognizes the seriousness of low water quality and recommends water pollution abatement programs throughout the basin. The preliminary report was criticized for the use of newspaper articles. The news reports give a historical perspective of what has happened and what is now occurring; only facts as reported to the news media by public officials or excerpts from published reports were used. The quality of plates and graphical illustrations has improved from the initial effort.

Again, this office appreciates the constructive, thoughtful remarks offered by reviewing agencies. It is our hope that this report will encourage further efforts to provide better quality waters for outdoor recreation. Should such an action occur, our study will have accomplished a degree of satisfaction.

INDEX OF REPLIES RECEIVED

1. U. S. Department of Agriculture, Forest Service
2. U. S. Department of Agriculture, Soil Conservation Service
3. U. S. Department of the Army, Corps of Engineers, North Central Division
4. U. S. Department of the Army, Corps of Engineers, Buffalo District
5. U. S. Department of the Army, Corps of Engineers, Lake Survey District
6. U. S. Department of the Interior, Regional Coordinator, Northeast
7. U. S. Department of the Interior, Bureau of Commercial Fisheries
8. U. S. Department of the Interior, Bureau of Sport Fisheries and Wildlife
9. New York State Conservation Department
10. Central New York State Parks Commission
11. Finger Lakes State Parks Commission
12. Genesee State Park Commission
13. Niagara Frontier State Park Commission
14. Thousand Islands State Park Commission
15. New York State Department of Health
16. Pennsylvania Department of Forests and Waters
17. Great Lakes Commission
18. Monroe County Department of Parks
19. Onondaga County Department of Public Works
20. Finger Lakes Association, Inc.

C UNITED STATES DEPARTMENT OF AGRICULTURE
O FOREST SERVICE
P EASTERN REGION
Y 633 W. Wisconsin Ave., Milwaukee, Wisconsin 53203

In Reply Refer To
2340

April 5, 1967

Mr. Roman H. Koenings
Regional Director
Bureau of Outdoor Recreation
3853 Research Park Drive
Ann Arbor, Michigan 48104

Dear Mr. Koenings:

Enclosed are copies of Lake Ontario Basin Preliminary Reports No. 015 and 016.

We have no specific comments on the text of the report. We do, however, appreciate having had the opportunity to review it and would appreciate receiving copies of the final report, as it contains much information that would be of value to us.

Sincerely yours,

(Signature)
H. A. SVENSEN
Assistant Regional
Forester

Enclosures

COPY

UNITED STATES DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
Room 400, Midtown Plaza
700 E. Water Street
Syracuse, N. Y. 13210

April 13, 1967

Mr. Roman H. Koenings
Regional Director
Bureau of Outdoor Recreation
Lake Central Region
3853 Research Park Drive
Ann Arbor, Michigan 48104

Dear Mr. Koenings:

Thank you for the opportunity to review the two preliminary draft reports on "Water Oriented Outdoor Recreation-Lake Ontario Basin." Various members of my staff have reviewed the reports and collectively agree they are well written. It is our understanding that the essential purpose of the report is to describe present water oriented recreational opportunities in the Lake Ontario Basin and the problem caused by pollution. We have no specific comments to make on these drafts, but would appreciate receiving copies of the final reports when they are made available.

Sincerely yours,

(Signature)
Wallace L. Anderson
State Conservationist

Enclosures 2

C DEPARTMENT OF THE ARMY
O NORTH CENTRAL DIVISION, CORPS OF ENGINEERS
P 536 SOUTH CLARK STREET
Y SEAL Chicago, Illinois 60605

IN REPLY REFER TO:
NCDPD-ER

4 May 1967

Regional Director
U. S. Department of the Interior
Bureau of Outdoor Recreation
Lake Central Region
3853 Research Park Drive
Ann Arbor, Michigan 48104

Dear Sir:

Returned herewith are two copies of your preliminary draft of the report "Water Oriented Outdoor Recreation, Lake Ontario Basin." The draft has been reviewed previously and comments furnished by the District Engineer, Buffalo, New York, on 14 April 1967.

We have no additional comments to offer at this time. However, we have reviewed your report with great interest, particularly those sections on methodology, recreation supply and demand, and water quality influences. It has been noted, also, that your recommendations in chapter 9 stress the importance of water quality and the need for control and abatement of pollution at its sources. We concur in these recommendations.

Receipt of two copies of your report, upon completion, would be very much appreciated.

Sincerely yours,

(Signature)
J. S. KING
Chief, Planning Division

1 Incl.(dup)
as

C DEPARTMENT OF THE ARMY
O BUFFALO DISTRICT, CORPS OF ENGINEERS
P Foot of Bridge Street
Y SEAL Buffalo, New York 14207

IN REPLY REFER TO NCBED-B 14 April 1967

Regional Director
Bureau of Outdoor Recreation
3853 Research Park Drive
Ann Arbor, Michigan 48104

Dear Sir:

We have reviewed the preliminary draft of your report "Water Oriented Outdoor Recreation - Lake Ontario Basin." Our comments will be limited to your references to work of the Corps of Engineers. Data below are for your information and may be used to the extent you desire.

The last paragraph of 4-22 discusses beach erosion control projects. The project at Selkirk Shores State Park is about 49 percent complete, but no schedule has been set for completion. No work has yet been done on the projects at Fair Haven Beach and Hamlin Beach State Parks. Advance planning for the Hamlin Beach project will start in 1967.

Recreational boating facilities are listed in table A-6, shown on plate 4-8 and discussed on pages 4-23 and 4-43. It should be noted that local interests are required to provide up to 50 percent of the cost of facilities provided by the Corps for recreational boating.

Considering the harbors in the order listed in table A-6, the existing project at Wilson Harbor is complete. A report recommending provision of additional facilities is under review. The project at Olcott is complete. Advance planning for Oak Orchard Harbor has been started, but no construction has been done. About 200 boats are now based there.

The harbor at Rochester is primarily commercial with no Federally-provided facilities for recreational boating. Continuing commercial development will gradually reduce the space available for recreational boating. Only advance planning has been done for the Irondequoit Bay project, and construction has not started. At present, many of the 1500 boats based in the bay are unable to negotiate the channel between the bay and Lake Ontario.

Great Sodus Bay Harbor is a commercial harbor with no Federal facilities for recreational boating. No work has been done on the project for Port Bay Harbor. Little Sodus Bay Harbor was constructed as a commercial harbor, but now has no commercial use and is maintained for recreational boating. Oswego Harbor is a commercial harbor with no Federal facilities for recreational boating.

No work has been done on the project for Port Ontario Harbor. Sackets Harbor, Cape Vincent Harbor and Morristown Harbor were constructed as commercial harbors and have not been maintained in recent years, but are used to some extent by recreational craft. Ogdensburg Harbor is also a commercial harbor.

In addition to those listed, studies are underway for provision of recreational boating facilities at : Fourmile Creek State Park; Hamlin Beach State Park; Braddock Bay, Cranberry and Long Ponds; and Pultneyville. Authorized studies have not been started for Golden Hill State Park, Mexico Bay(mouth of Little Salmon River) and Chaumont River.

Copies of the draft are returned. We would appreciate receiving the final report, as it will contain much information of value in our studies.

Sincerely yours,

(Signature)
L. E. LUFKIN
Major, Corps of Engineers
Deputy District Engineer

1 Incl
Draft
(in dup)

C DEPARTMENT OF THE ARMY
O LAKE SURVEY DISTRICT, CORPS OF ENGINEERS
P 630 Federal Building
Y SEAL Detroit, Michigan 48226

In reply refer to:
NCLRC

27 April 1967

Regional Director
Lake Central Region
Bureau of Outdoor Recreation
3853 Research Park Drive
Ann Arbor, Michigan 48104

Dear Mr. Haynes:

As requested by your 17 March 1967 letter, reference D6427GL, the following comments are submitted on your publication, "Water Oriented Outdoor Recreation, Lake Ontario Basin":

a. Page 2-1: Figures listed do not agree with the most recent data sheet, copy attached (incl 1), source of data No. 188 on page D-15 should be updated.

b. Page 2-11: Maximum depth 802 ft. Seasonal fluctuations 2.21 ft or 2.24 ft (compare incl 2).

c. Page 2-13: The Niagara River is not listed as a major tributary. Certainly the lower Niagara River should be considered as part of the Ontario Basin.

d. Page 2-15: Power production on the lower Niagara River is not mentioned in the second paragraph. Consideration should be given to including this for completeness of discussion of the section on the rivers of Lake Ontario.

e. Page 2-16: The last line should read "from agricultural production."

Sincerely,

(Signature)
WILLIAM J. SCHUDER
Lt. Colonel, Corps of Engineers
District Engineer

3 Incl
1. Data sheet
2. Water Levels
3. Prel Rpt

C
O
P SEAL
Y

UNITED STATES
DEPARTMENT OF THE INTERIOR
OFFICE OF THE SECRETARY
NORTHEAST REGION
John F. Kennedy Federal Building
Room 2003 J & K
Boston, Massachusetts 02203

March 29, 1967

MEMORANDUM

TO: Roman H. Koenings, Regional Director, BOR,
Ann Arbor, Michigan

FROM: Regional Coordinator, Northeast Region

SUBJECT: Lake Ontario Basin Report

I have given a swift cursory inspection of the preliminary draft of the report "Water Oriented Outdoor Recreation - Lake Ontario Basin" sent to me on March 17, 1967.

My only comment concerned studies which are now underway in the report area and which were not mentioned (at least I did not see any reference to them in my "swift cursory inspection").

In the Genesee River Basin there is underway a comprehensive study of all water and related land resources. The recreation potential of this basin is being thoroughly studied and an appendix on this subject will be part of the report. BOR has a large part in these studies.

There is also a study underway on the "Levels of the Great Lakes" under the aegis of the International Joint Commission. This study will look into the possibilities of stabilizing the levels of all of the lakes through regulation works. Such stabilization should have a great effect on recreation, since both high and low water conditions will be improved and this will therefore improve the possibilities of expanded recreational use.

I believe that information of this sort should be included in your report.

The preliminary report is returned herewith, as requested.

(Signature)
Mark Abelson

Enclosure

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UNITED STATES GOVERNMENT
MEMORANDUM

DATE: April 19, 1967

TO : Regional Director, Lake Central Region, BOR
Ann Arbor, Michigan

FROM : River Basin Studies Coordinator, BCF
Ann Arbor, Michigan

SUBJECT : GLIRBP--Lake Ontario Segment--BOR March 1, 1967
Preliminary Draft Report on Outdoor Recreation

We have reviewed the subject draft and have no comments from the commercial fisheries standpoint. We do, however, have some general comments bearing on overall water quality aspects.

1. Throughout the report there is an apparent misuse or misunderstanding of the word "principle" for the word "principal". This error has been specifically detected on pages v, 2-11 and 2-15.

2. We wonder whether implementation of recommendation 2 on page v may not be detrimental to the ultimate objective of improving overall water quality in the Lake Ontario Basin. We agree with the recommendation in principle. However, the suggested activity would tend to be of a fragmented and individual nature. The net result could be the same as experienced in other areas of water resource management--unnecessary competition for funds, inefficiency and administrative bickering. The public interest would not receive its just attention and service. Inclusion of a phrase stressing that water quality programs should be undertaken with coordinated planning and/or organization would take care of the matter. This corrective action also strengthens the concluding sentence on the following page (vi) which could now read--

> "Continued and improved cooperation between Federal, State and local governments is essential to achieving this common goal."

3. Concerning the inclusion of "ski resorts" as an area of study emphasis as stated on page 1-3, we have no disagreement with their inclusion or the other winter sports *per se*. Skiing, sledding and ice skating, etc., should rightfully be considered in this report. However, it may be overstretching the point to include skiing (and sledding) as "water-oriented outdoor recreation" as indicated by the first sentence in section C, *Scope*, on page 1-2.

Corrective action to remove this inconsistency might take the form of replacing sentence one of section C with--

> "In addition to the consideration of water-oriented outdoor recreation, this report also includes study of certain winter outdoor recreational activity in the basin."

4. Inspection of Plate 2-3 (page 2-7) indicates the graph for water surface temperature (mean monthly) is missing. Likewise, the appropriate symbol in the legend area below the graph is missing.

5. With regard to the discussion on water quality (Chapter 6) and graphical presentation (Plate 6-1), we question some of the content and implication of this material as it now reads. This material seems to accept a classification for sole or principal use as sewage and industrial waste disposal. We recognize that New York State has (or had) such a classification. However, such a use classification is expressly prohibited in FWPCA "Guidelines for Establishing Water Quality Standards". It might, therefore, be appropriate for your report to bring out the fact that the classification and consequent use of certain stream reaches for sewage/industrial waste disposal preempts the use of these same stream reaches for water-oriented outdoor recreational purposes. This suggested position would be more consistent with your presentation of tangible losses to recreation from poor water quality on Onondaga Lake commencing on page 6-35.

We appreciate the opportunity to comment on this report and commend those responsible for a fine contribution to the GLIRB Study.

As per your request, we are returning under separate cover the two copies we received for review purposes.

(Signature)
Robert L. Schueler

2 Draft copies - u/s/c

SEAL UNITED STATES In reply refer to:
DEPARTMENT OF THE INTERIOR RB
C FISH AND WILDLIFE SERVICE
O Bureau of Sport Fisheries and Wildlife
P 1006 West Lake Street
Y Minneapolis, Minnesota 55408

April 7, 1967

MEMORANDUM

To: Regional Director, Bureau of Outdoor Recreation, USDI
Ann Arbor, Michigan

From: Acting Regional Director, Bureau of Sport Fisheries
and Wildlife, USDI, Minneapolis, Minnesota

Subject: Review of Preliminary Draft - Lake Ontario Report

We appreciate the opportunity to review and comment on the subject report. We concur generally in the comments and conclusions reached in your report and find it to be a well-written document.

Thank you for the review opportunity.

(Signature)
S. E. Jorgensen

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STATE OF NEW YORK
CONSERVATION DEPARTMENT
ALBANY

SEAL
R. Stewart Kilborne
Commissioner

April 14, 1967

Mr. Evan A Haynes
Bureau of Outdoor Recreation
3853 Research Park Drive
Ann Arbor, Michigan 48104

Dear Mr. Haynes:

We wish to submit the enclosed comments pertaining to the preliminary draft of your report "Water-Oriented Outdoor Recreation - Lake Ontario Basin" which you furnished for our review.

The report represents a great deal of research and effort which is evident by the meticulous care that went into referencing the numerous sources of information. Many appropriate examples of park overcrowding, water pollution and recreational use patterns were used to make the report more interesting and effective in portraying the actual situation in the Ontario Basin. Some very pertinent conclusions and recommendations were also made concerning the need for providing additional water-dependent recreation facilities especially near Metropolitan Areas, and the need to attach water quality problems associated with eutrophication.

Although this is a good report for its intended scope, there are several areas that might lend themselves to improvement and modification.

1) Length of Report - The report would be more effective if it could be made somewhat more concise. This might be accomplished by eliminating some of the unnecessary descriptive detail that contributes little to a technical report. For example, the description of the historical development of the canoe (Page 4-29) is interesting but of no direct relevance. Other places could be found to make the report more compact.

2) Needs Requirements - The recreation needs requirements described in Section 5 are expressed in terms of required acres of developed recreation land. Converting the recreation needs into land resource requirements is a meaningful way of defining the problem. The main disadvantage of this unit by itself, however, is that it does not clearly identify the particular resource requirements for different activities. It would be helpful if activity resource requirements were developed, in addition to total land needs.

3) Water Quality Influences - The content of Section 6 on water quality influences was not consistent with the objective presentation of the rest of the report. Rather than straight-forwardly identifying the water quality problems,

the roots of the problem, and remedial courses of action, this section dwelled too long and in too much detail on case histories of water pollution and upon the adverse effects associated with pollution.

In many cases, the tone towards water pollution tended to be negative. It was highly critical of several beach closing situations and the government level involved, without also pointing toward the improvement to be achieved through New York State's Pure Waters Program. In particular, Conclusion I on page 8-2 seems inappropriate, especially in view of the cases cited, the officials seemed to act with prudence and certainly within the State water quality standards. In addition, since September 1, 1965, 237 orders to abate pollution have been issued through the New York State Health Department enforcement program. When the standards were contravened or when the danger became obviously apparent, positive action was taken. It must also be realized here that a coliform standard, whether it be 1000 or 2400 per 100 ml., is at best arbitrary. Until a definite casual relation between coliform counts and health risk is established, debate over acceptable standards will continue to be inconclusive.

At several other points in this section, general statements were presented which tended to make the problems seem more widespread than in actuality. Section D, page 6-24 and 25 on water quality influences on fishing suggests a basin-wide decline in fishing which is supported by only a single case study on Onondaga Lake. Section H, Part 2 on tangible losses to boating, an example of sedimentation at a marina is offered as a typical problem, yet little other supporting material is presented to prove that it is any more than a local problem.

Even the five examples of sub-standard water quality at swimming areas do not give the reader a fair overall picture of the problem as it pertains to the entire basin.

In general, the comments made in this section are negative. The problem areas mentioned are significant but do not characterize the entire study area or even a major portion of it. The constant leaning on newspaper articles and semiprofessional reports to support their comments and inferences results in a very weak section of the report.

4) Vacation Visitors - The number of vacation visitor-days occurring in the Lake Ontario Basin seems inordinately high, and probably results from computations performed in Table B-2. In this table, the total number of vacation visitor-days is multiplied by the percentage of the recreators who participated in individual activities during their vacation. These computations would be valid if every visitor participating in an activity did so on every day of his 6.4 day

vacation. Since such a situation is highly unlikely, the total number of activity days is inflated and should be reduced accordingly.

Sincerely,

R. Stewart Kilborne
Commissioner

By

(Signature)
W.M. Lawrence
Deputy Commissioner

Enclosure

COPY

STATE OF NEW YORK
SEAL
CONSERVATION DEPARTMENT
DIVISION OF PARKS

CENTRAL NEW YORK STATE PARKS COMMISSION
Jamesville, N.W. 13078

March 31, 1967

U. S. Dept. of Interior
Bureau of Outdoor Recreation
Lake Central Region
3853 Research Park Drive
Ann Arbor, Michigan 48104

Re: Lake Ontario Basin Water
Oriented Outdoor Recreation

Attn: Evan A. Haynes
Acting Regional Director

Gentlemen:

We have made a quick review of your preliminary draft of report, "Water-Oriented Outdoor Recreation."

We strongly urge you to delete the following text:

Page 6-27 (first paragraph) - In a special unpublished report (80) from the park superintendent to the assistant regional park manager, the following remark was made for June 22, 1964: "....can't understand how people can bathe in the 3 inch green blanket of scum." On that particular day, there were 740 recreationists who used the park beach despite a posted "poor swimming" sign at the park's entrance.

The above statement was an "off the cuff" remark and not for publication.

Our other comments include the following:

1. Page A-10 and A-11: Green Lakes and Verona Beach are erroneously listed as having boat launching sites.

2. Appendix C, Zone 2:
   (a) Acreage for Verona Beach should be 1355 not 27.
   (b) Battle Island does not have picnicking or tent camping. It is on the Oswego River not on a tributary.
   (c) Verona Beach does not have boating.
   (d) Clark Reservation is adjacent to Butternut Creek.

We were very much impressed with the report. It should prove of great value to the Federal Water Pollution Board as part of their comprehensive study.

Very truly yours,

(Signature)
Samuel Perry
Regional Park Manager

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STATE OF NEW YORK

SEAL

CONSERVATION DEPARTMENT
DIVISION OF PARKS
FINGER LAKES STATE PARKS COMMISSION
R.D. 3, Trumansburg, N.Y. 14886

May 1, 1967

Mr. Roman H. Koenings, Regional Director
U. S. Department of the Interior
Bureau of Outdoor Recreation
Lake Central Region
3853 Research Park Drive
Ann Arbor, Michigan 48104

Attention: Mr. Henley

Gentlemen:

Please refer to your telephone call of April 25, 1967, inquiring as to the status of the Finger Lakes State Parks Commission comments to the preliminary report on the Water Oriented Outdoor Recreation, Lake Ontario Basin.

Mr. D. E. Ryan, Regional Park Manager, is out of the office on sick leave. I have located only one copy of the report but was led to believe after talking with you, that you had mailed two copies to this agency.

I have made a quick review of Appendix C - Inventory of Existing Recreation Areas and can suggest the following changes as they apply to State Parks in the Finger Lakes Region:

Zone 1

1. Site No. S-10 - Stony Brook State Park. Please add "X" in column designating Group Camping.

Zone 2

2. Site No. S-22 - Seneca Lake State Park. Please change area to read 265.

3. Site No. S-27 - Watkins Glen State Park. Kindly delete the "X" listed under fishing. There is no fishing in the park.

Zone 5

4. Site No. S-127 - Fair Haven Beach State Park. Area in acres should be 1,096 instead of 1,176 as shown.

I assume that the acreage figures listed in your appendix were taken from the BOR Forms #BOR 8-73 submitted by each Region back in December, 1964.

Very truly yours,

FINGER LAKES STATE PARKS COMMISSION

(Signature)
Abraham George, Jr.
Assistant Regional Park Manager

AG:cw

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STATE OF NEW YORK

SEAL

CONSERVATION DEPARTMENT
GENESEE STATE PARK COMMISSION

May 11, 1967

Mr. Roman H. Koenings
Regional Director
Bureau of Outdoor Recreation
U. S. Department of the Interior
Lake Central Region
3853 Research Park Drive
Ann Arbor, Michigan 48104

Re: Water Oriented Outdoor
Recreation Lake Ontario
Basin Preliminary Report

Dear Mr. Koenings:

As requested, I have reviewed the preliminary draft dated March-1967 of the report "Water Oriented Outdoor Recreation Lake Ontario Basin" prepared by your staff.

I am attaching a list of comments which I noted as I proceeded page by page through the Report. In some instances, as I reached the later pages of the Report I found that the data which was the subject of my previous comment had been reviewed in much more detail. I made no attempt to revise my original comments, however, and leave that to your consideration.

I am also attaching for your general information an analysis by camper days of the origin of patrons using our cabins and campsites at Letchworth State Park. It was quite interesting to observe that approximately 40% came from outside the State. Also attached for your general file is a set of the illustrations furnished by Task Group No. 8 - Recreation for the Genesee River Basin Study. The data as to Supply and Demand was taken from a Report by your Philadelphia office.

I hope that my comments may be of some help to you.

Cordially

(Signature)
Gordon W. Harvey
Chief Engineer and Regional
Manager

GWH/scb
Encls.

CC: Mr. Roland B. Handley

STATE OF NEW YORK
CONSERVATION DEPARTMENT
GENESEE STATE PARK COMMISSION
P.O. Castile, N. Y. 14417

Attachment to letter to Mr. Koenings May 11, 1967

RE: Water Oriented Outdoor Recreation Lake Ontario Basin Report

COMMENTS

Page iii - Re Banning Swimming at Some Public Beaches. It has recently been announced that the three beaches of Monroe County at the City of Rochester will be closed the summer of 1967. It may be 5 to 7 years before conditions can be corrected. In the meantime, Hamlin Beach State Park, 25 miles to the west, must pick up the brunt of this load.

Page 1-7 - Re "Day-Use Zone". My personal opinion is that the 40 mile radius is outmoded where good roads exist. In this area I know that Letchworth State Park draws maximum crowds from both Buffalo and Rochester with effective radii of 60 miles.

Page 2-20 - Canadice and Hemlock Lakes are in Rochester Watershed and are not available for recreation, with very limited exceptions.

Plate 2-11 The Parkway on the east side of the Niagara River is complete across Grand Island and from North Grand Island to Lake Ontario.

The Southern Tier Expressway is complete from a point about 10 miles northwest of Corning to a point about 4 miles east of Elmira.

Page 2-39 Re Vacationing Population. See attached analysis of 1966 cabin and campsite rentals at Letchworth State Park.

Page 3-1 Under "Methodology" you indicate that demand comprises two components and define the Express Demand as represented by use of existing facilities. This is somewhat confusing to me. Recognizing as I do that at no time in the past have enough existing facilities existed in our recreation areas to meet the Demands of the public, I have always contended that attendance figures are not indicative of Demand but rather of expanded or improved facilities. This is borne out by the fact that whenever we have developed or improved areas, the expanded facilities are promptly over used within a year of construction and at the end of the year they become "turn-away". This is also confusing because in the Genesee River Basin Report, B.O.R. refers to Demand as one entity whether manifest or latent and appears to treat Supply as any existing or anticipated outdoor recreational opportunity that will satisfy a Demand. In general, under conditions stated above, Supply equals the Expressed Demand, represented by use of existing facilities.

Page 3-2 - See attached graphs for 4 key facilities in the Genesee Market area (14 counties in western New York plus 4 in Pennsylvania).

Page 4-10 - See Figure 13 of attached data re "Portage" project immediately south of Letchworth State Park.

Attachment to letter to Mr. Koenings May 11, 1967

RE: Water Oriented Outdoor Recreation Lake Ontario Basin Report

COMMENTS (continued)

Page 4-16 It would be appropriate to refer to the Federal-State Program for the establishment of harbors of refuge. In my Region, harbors and related marinas are planned at Oak Orchard Creek, Hamlin Beach State Park, Braddock Bay State Park and Irondequoit Bay. Others are being considered by the Army Engineers in other Regions.

Page 4-22 "Beaches at Hamlin Beach State Park.... have been rehabilitated." An authorized Federal project is available for this work but construction is not expected for several years. I am not familiar with the status of the Fairhaven and Selkirk projects but they could be checked by phone calls.

Page 4-37 Fifth line - "proposed Niagara Parkway" -Should be "existing Robert Moses State Parkway."

Page 4-38 Deer hunting is permitted in selected areas of Letchworth State Park when it is certified that the deer population is excessive.

Page 5-2 and Table 5-1 I believe that "developed recreation acreage" refers only to that portion of a park acreage developed for intensive mass recreation. These figures are sometimes misunderstood. In the Genesee Basin Report it was found necessary to point out that, in the case of major recreation areas such as State parks, this intensively developed area represents only about 10 to 15 percent of the total area in the larger parks and the balance is needed for protection and to preserve the scenic and natural setting. The methodology appears to me to assign too little acreage for protection and preservation of the existing natural values. As a result, I would be inclined to increase the "additional deficit acreage needed".

Page 5-4 Letchworth State Park is a resource-oriented area and has been described as "of national significance" and "meeting the criteria of a national recreation area". Possibly an exception should be noted.

Page 5-6 We attached analysis of Letchworth campers indicating that 40 percent are from outside the State.

Page 7-2 Table 7-1 Seems to be overly optimistic, at least as far as the findings for the 14 western counties of New York and 4 in Pennsylvania in the Genesee Basin Report.

Page A-10 "A. Recreational Harbors" - Add "Braddock Bay - 500"

COPY

NIAGARA FRONTIER
STATE PARK COMMISSION
SEAL
PROSPECT PARK-NIAGARA RESERVATION
Niagara Falls, N.Y.

April 27, 1967

Mr. Evan A. Haynes, Acting Regional Director
Bureau of Outdoor Recreation
3853 Research Park Drive
Ann Arbor, Michigan 48104

RE: D6427GL

Dear Mr. Haynes:

I have talked with Robert Henley, of your office, some of the comments which we have in relation to the preliminary draft of your report "Water-Oriented Outdoor Recreation - Lake Ontario Basin" and in agreement with our understanding I am sending them by letter.

Page 4-37 paragraph at the top of page refers to "....linking it with the proposed Niagara". It should read "Robert Moses State Parkway which will originate at Beaver Island State Park". Instead of "Beaver Island State Park" it should be "North Grand Island Bridge" so it will read "...linking it with the proposed Robert Moses State Parkway which will originate at the North Grand Island Bridge".

Page 4-43 a note at the bottom of the page refers to "8 harbor proposals along the Lake shoreline". As we have preliminary authorization for harbor proposals at Four Mile Creek and Golden Hill State Park I hope they are included in this inventory.

Page 7-4 Under the Establishment of objectives, I believe that reference should be made here to the water pollution abatement to up grade the Niagara River from below the Falls to Lake Ontario in order to bring back boating, water skiing and possibly swimming. This portion of the River is very heavily polluted by the City of Niagara Falls, New York and by residents along the River, who discharge raw sewage directly into the River. It is my understanding that 90 percent of the solids from the Niagara Falls, New York sewage plant discharges directly into the River. If this is covered under some other report, there should be some reference to the report so that the recognition is made in your release for the Lake Ontario Basin.

The Niagara River below the power plants has some of the best boating and water skiing areas in the region if the pollution were not so severe. This is also a factor that effects the propagation of wild life and fish in the River.

I note that throughout the entire report there is very little reference to the Niagara River and to the SMSA's along Lake Ontario in Niagara County. This is a very serious problem which should be recognized and corrected. I refer specifically to 12 Mile Creek which discharges into the Lake in the vicinity of Wilson, Eighteen Mile Creek in the vicinity of Olcott, and Golden Hill Creek which discharges into the Lake in the vicinity of Golden Hill State Park.

In the Appendix on Page A-10 the listings have Recreational Harbors, which should include Golden Hill. We have existing a boat marina with the estimated number of boats based - 40. This marina has existed prior to our acquisition and we have carried it over on a temporary basis until Park development will enlarge the facilities.

Under the listing of parks Appendix C-Zone 5 the following corrections should be made:

Lewiston State Park has an acreage of 119.
Fort Niagara State Park has an acreage of 284.
Wilson-Tuscarora State Park has an acreage of 311.

Under the listing for County Parks - Zone 5 Krull County Park has a visitation of 100,000 not 10,000-1963.

Generally the report is very well done and compiles a great amount of work which is very interesting and useful.

I am returning the 2 preliminary books as instructed and request that when the final printing is carried out we receive 2 sets for our files and reference.

Very truly yours,

(Signature)
Arthur B. Williams
General Manager

enc.

COPY

State of New York

SEAL

CONSERVATION DEPARTMENT
THOUSAND ISLANDS STATE PARK COMMISSION
Alexandria Bay, New York

April 14, 1967

United States Department of the Interior
Bureau of Outdoor Recreation
Lake Central Region
3853 Research Park Drive
Ann Arbor, Michigan 48104

Attention: Mr. Roman H. Koenings

Gentlemen:

I am returning the two preliminary booklets on "Water-Oriented Outdoor Recreation-Lake Ontario Basin" with the following comments:

1. The Recreation Bond Issue Program in New York State was $200,000,000 for development. The additional $200,000,000 is being received from matching federal and municipal funds plus State appropriations.
2. In the St. Lawrence sub-basin, we have 12 parks in our region. I believe you forgot Jacques Cartier State Park.
3. On plate No. 4-2, you have not located Coles Creek Area of Robert Moses State Park. This area is situated two (2) miles northeast of the village of Waddington, New York.
4. In your recreation develbpment chart, be advised that Southwick Beach State Park does have picnicking.

We congratulate you on your fine report, and we will be looking forward to receiving copies upon completion.

Very truly yours,

THOUSAND ISLANDS STATE PARK COMMISSION

(Signature)
Ralph D. Wallace
Regional Park Manager

RDW:bw
Enc.

C STATE OF NEW YORK
O DEPARTMENT OF HEALTH
P 84 Holland Avenue
Y SEAL Albany, New York 12208

April 12, 1967

Mr. Roman H. Koenings
Regional Director
Bureau of Outdoor Recreation
U.S. Department of the Interior
3853 Research Park Drive
Ann Arbor, Michigan 48104

Re: Preliminary report - Water Oriented Outdoor Recreation - Lake Ontario Basin - March, 1967

Dear Mr. Koenings:

This will acknowledge receipt of your letter dated March 17 to Doctor Ingraham enclosing the preliminary draft of the report entitled "Water Oriented Outdoor Recreation - Lake Ontario Basin".

The report is very well presented and illustrated. It contains a great deal of interesting and pertinent information pertaining to the impact of water quality upon recreation in the basin. One of the major objectives in the State's Pure Waters Program is to correct the existing sources of pollution which contribute to degraded water quality conditions. A major phase of the program involves a billion dollar construction bond issue which has been noted in the report.

The following suggestions are made for inclusion in the final report:

(1) Plate 6-1 showing classes of best usage assigned to waters of the basin should be amended to reflect the elimination of Classes E and F. We further anticipate that the special class for the Lower Genesee River will be eliminated as the result of public hearings held in late 1966 and early 1967.

(2) Page 6-5 relates to coliform criteria for bathing waters. Two bills amending the Van Lare Law have recently been passed by the Legislature and sent to the Governor.

(3) A reference should be made about the effects of oils and other waste discharges from ocean going vessels using the St. Lawrence Seaway upon the closing of beaches.

I hope the above comments will be of assistance to you and that you will feel free to call us regarding any questions you may have.

Thank you for the opportunity to review the report.

Sincerely yours,

(Signature)
Robert D. Hennigan

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SEAL

STATE OF NEW YORK
DEPARTMENT OF HEALTH
84 Holland Avenue
Albany, New York 12208

May 10, 1967

Mr. R. H. Koennings
Regional Director
Bureau of Outdoor Recreation
U.S. Department of the Interior
3853 Research Park Drive
Ann Arbor, Michigan 48104

Dear Mr. Koennings:

In reference to my recent telephone conversation with Mr. Henley of your Bureau regarding the effects of oil upon recreation waters in the St. Lawrence Basin, the following situations have occurred.

In 1961, Grassy Point Beach on the St. Lawrence River had to be closed for one day because a tanker discharged either oil or ballast water which covered the beach with a heavy, black bunker fuel oil.

Complaints are periodically received by the Department of Conservation from cottage owners along the river regarding oil washed onto the shore. The source is believed to be ballast water pumpage from passing tankers.

During the migratory and hunting seasons, complaints are made to the Conservation Department regarding either destruction of water fowl or immobility from oil wastes.

I trust that the above information will be of assistance to you.

Sincerely yours,

(Signature)
Robert D. Hennigan

Editorial Note: **This letter was received too late for incorporating its contents into the final report.**

C
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P SEAL
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COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF FORESTS AND WATERS
HARRISBURG
17120

April 26, 1967
In reply refer to
SP

Mr. Roman H. Koenings
Regional Director
U. S. Department of the Interior
Bureau of Outdoor Recreation
3853 Research Park Drive
Ann Arbor, Michigan 48104

Reference: D6427GL

Dear Mr. Koenings:

We have reviewed the preliminary draft of the report, "Water-Oriented Outdoor Recreation - Lake Ontario Basin", as requested in your letter of March 17, 1967.

As we mentioned by telephone to your Mr. Henley, we have no additions or comments to make regarding the report.

The preliminary drafts are being returned under separate cover.

Sincerely yours,

(Signature)
MAURICE K. GODDARD

C GREAT LAKES COMMISSION
O INSTITUTE OF SCIENCE AND TECHNOLOGY BLDG.
P 2200 North Campus Blvd.
Y Ann Arbor, Michigan 48105

April 24, 1967

Mr. Evan A. Haynes
Acting Regional Director
Lake Central Region
Bureau of Outdoor Recreation
3853 Research Park Drive
Ann Arbor, Michigan, 48104

Dear Mr. Haynes:

The Great Lakes Commission appreciates receiving a preliminary draft copy of the BOR report on "Water-Oriented Outdoor Recreation - Lake Ontario Basin" which accompanied your letter of April 4, 1967. In accordance with the request in your letter, I have reviewed the report, and below are some comments that you may wish to consider in preparing the final report. Prefacing these remarks, I wish to compliment your staff on the thoroughness and readability of the Lake Ontario Basin study. It should prove very useful to a wide range of interests in the field of water resources planning.

My comments and suggestions refer generally to minor matters, but ones which may add to the utility of the report.

page 2 - 8 The symbols used for the shore types become difficult to identify due to the reduction in the size of the map. Could the physical character of the various shore zones be indicated, along with the kinds of material or shore types? I refer to such shore features as bluffs, dunes, etc.

page 2 - 11 Reference is made to lunar tides but not to seiches. I believe the latter occur on Lake Ontario, although not to the extent or amplitude found in relatively shallow Lake Erie. Still, such changes in water level would be of more significance than the effect of lunar tides.

page 2 - 11 No reference is made to Lake Ontario Low Water Datum --242.8 feet above sea level (Father Point on the lower St. Lawrence River.) -- although LWD is referred to, but not defined on page 1-8.

page 2 - 11 No reference is made to the Iroquois Dam, on the upper St. Lawrence River, which serves to control the outflow from Lake Ontario and, thus, regulate its water level. Plan 1958-D, developed by the International St. Lawrence River Board of Control in 1963, indicates the water levels of Lake Ontario will be maintained, during the navigation season, between elevations 242.77 and 246.77 or as near thereto as possible.

page 2 - 33	The route numbers are too small to be read.
page 4 - 4	On plate 4 - 2 (and plate 4 - 3), it would be helpful to indicate that the reference numbers are identified in Appendix C. This is mentioned on page 4 - 2, but repetition on the map would serve as an additional aid.
page 6 - 6	Reference made to various studies would be better documented if based on the primary sources rather than on newspaper stories.
page 7 - 9	I do not believe that the regulations adopted by New York and Ontario regarding the discharge of waste from watercraft came about from any joint action.
Plates	A number of the map plates could be identified more readily if the plate numbers were displayed more prominently -- larger lettering and away from the binding edge of the pages.

We are returning the preliminary draft of your report and look forward to receiving a copy of the final report. It will provide a valuable addition to our reference documents on the Great Lakes.

Sincerely yours,

(Signature)
Albert G. Ballert
Director of Research

AGB/amp

Enclosure

P.S. The report is being returned as printed matter.

County of Monroe
New York

C Department of Parks
O 375 Westfall Road
P Rochester, N.Y. 14620
Y

SEAL

Telephone:
CH4-4640

March 30, 1967

Mr. Roman H. Koenings
Regional Director
U. S. Department of the Interior
Bureau of Outdoor Recreation
3853 Research Park Drive
Ann Arbor, Michigan 48104

Dear Mr. Koenings:

I have reviewed the enclosed preliminary drafts of your report "Water-Oriented Outdoor Recreation - Lake Ontario Basin" and feel that your report well presented the facts regarding water-oriented outdoor recreation in the Rochester-Monroe County area, as well as in the total Lake Ontario Basin.

The only concern I have as a result of studying this report is that perhaps it should have been extended further to include in our area the tributary streams of the Genesee River, i.e., Oakla, Honeoye and Black Creeks, in the Monroe County Area and also the Irondequoit Creek which flows into Irondequoit Bay. Certainly the pollution which enters these streams affects the river and consequently contributes to the pollution in the lake. The potential and the demand for recreation along all of these streams is great. I realize, of course, that your study is broad in scope and perhaps it is incumbent upon the County to extend this study to include these tributary streams.

I should appreciate receiving a copy of the final report upon completion.

Thank you very much for your consideration.

Yours very truly,

(Signature)
ALVAN R. GRANT
Director of Parks

Enc. (2)

C
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Y

COUNTY OF ONONDAGA

SEAL

DEPARTMENT OF PUBLIC WORKS
DIVISION OF PARKS AND CONSERVATION

P.O. Box 146
Liverpool, N.Y. 13088

April 17, 1967

Evan A. Haynes
Acting Regional Director
U.S. Department of the Interior
Bureau of Outdoor Recreation
Lake Central Region
3853 Research Park Drive
Ann Arbor, Michigan 48104

Dear Mr. Haynes:

We enclose herewith the two preliminary drafts, No. 51 and 52, as submitted by your office of "Water-Oriented Outdoor Recreation - Lake Ontario Basin.

We believe, after due study and review of the entire report, that the finished product is an excellent compilation of the recreation problem for the Lake Ontario Basin.

We note a few minor corrections - mainly in spelling - which we offer for your consideration prior to final submission of the report to the Federal Water Pollution Control Administration: They are

2-17 4th line from bottom devoted to Commerical farming
should be Commercial

2-23 Montazuma should be Montezuma line 2
Cauyga Lake should be Cayuga line 3

Appendix C page 2 Mud Lake Wetlands site "S-50"
326 acres - undeveloped
might be same as
Appendix C page 5, Site L-10
Beaver Lake Park 498 undeveloped ?

Appendix B-9
C "Methology" should be "Methodology"
second line from bottom of page.

Very truly yours,

(Signature)
J. HOWARD SHATTUCK
Deputy Commissioner

JHS:cc
2 encs.

C Finger Lakes Association, Inc.
O Lake Street Plaza, Penn Yan, N.Y. 14527
P SEAL May 19, 1967
Y

Mr. Roman H. Koenings
Regional Director
U.S. Dept. of the Interior
Bureau of Outdoor Recreation
3853 Research Park Drive
Ann Arbor, Michigan 48104

Dear Mr. Koenings:

Earlier this month I wrote to Mr. Haynes requesting an extension of your deadline for evaluating the preliminary report on "Water-Oriented Outdoor Recreation - Lake Ontario Basin." Subsequently Mr. Henley called and informed us as to your deadline commitments.

In view of this we simply want to congratulate you on the outstanding job you have done on compiling a variety of information concerning the Lake Ontario Basin. We also want to express appreciation for your thoughtfulness and courtesy in contacting this office during the research phase.

We found the preview report most enlightening and while there wasn't time to completely evaluate it there was some concern expressed relative to the identity of the Finger Lakes as well as the region they encompass being a recreational entity. Curiously Zone 2, the Oswego Subbasin, involves nearly all our counties.

Generally, the information in the report seems well researched and we shall look forward to receiving the final.

Very truly yours,

(Signature)
Conrad T. Tunney
Executive Director

CT/t